6d

THE Journal OF AGRICULTURE

VOL. 61
No. 5

NOVEMBER

1940

2 OCT 1968

ONWARD

Issued by
THE NEW ZEALAND
DEPARTMENT OF AGRICULTURE

NOW!—After Calving——

● INOCULATE

YOUR HERD WITH

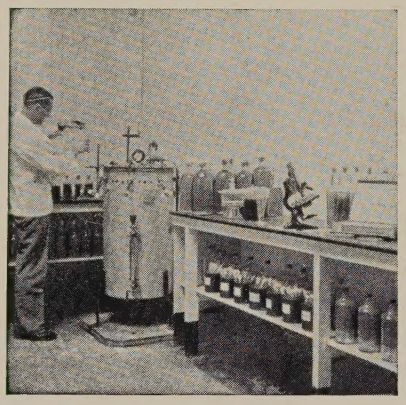
MANNINGS

NEW VACCINE

FOR MAMMITIS IN DAIRY COWS

(PREPARED IN OUR OWN BACTERIOLOGICAL LABORATORY)

LOOK FOR THE TRADE MARK "MANNINGS," IT STANDS FOR RELIABILITY AND SATISFACTION.



●

Manning's
Bacteriological Laboratory,
where
Manning's New Vaccine is
made, and
where many thousands of
milk samples are examined
each year.

●

● Inoculate your Herd for Mammitis

MANNINGS LTD., Box 300, HAMILTON.

Please send me, without obligation, FREE particulars of your new vaccine.

Name: .....

Address: .....

Taranaki Agents: Farmers' Co-op. Ltd. *Wairarapa Agents:* Wairarapa Farmers' Co-op.
North Auckland Agents: North Auckland Farmers' Co-op. Ltd.

The New Zealand Journal of Agriculture

Published by direction of the Hon. W. LEE MARTIN, Minister of Agriculture.

Vol. 61 WELLINGTON, NOVEMBER 15, 1940. No. 5

Here Is a Message From The Director of Primary Production—

"Let 1940-41 Be a Seed Production Year"

TO be successful in farming, adaptability on the farmer's part to changing circumstances is essential. Farming is not a static industry; it is dynamic, ever-changing, and is subject to fluctuations caused by such things as climate, disease incidence, labour conditions and market prices for produce. War conditions introduce a new factor into the economic vagaries to which farming is prone, and the nation's needs must have priority over the individuals personal preferments in the activities he is undertaking.

In the present crisis, with Britain and the Empire in a life and death struggle for existence, it is of paramount importance that all our energies should be directed to the most effective end, and the "farming front," which is all-important in providing the necessary sinews of war, can play an extremely important part in making up the deficiencies in primary products which have arisen in Britain as a result of many of her normal markets now being closed.

Farming Adapted

New Zealand's efforts so far have been good. Her farmers have responded well to the call for increased production. Wheat areas have been increased. Our maize acreage will be a record. A new linen flax industry has been established. Crops have been sown for special feed purposes. Provision has been made enabling the Dominion to be self-supporting in such seeds as turnips, swedes, rape, kale, mangels and other forage crops. The drive for an added 10,000 tons of bacon is well on its way to fruition. The change-over of a portion of our milk from butter to cheese has been effected. Never in the history of the Dominion has so much fertiliser and lime been spread on the land as at present, and the kindly spring which has obtained over the whole Dominion augers well for a record production year.

In other words, farmers have adapted, and are still further adapting, their programme of work to suit the changing conditions demanded by the Empire's needs, and it is not being too optimistic to predict a record production year for the season 1940-41.

Further Help

Much has been done, but more will require to be done before successful finality to the war is brought about. How further can we help? It must be apparent to all that, with the great growth of grass which has taken place in most parts of the Dominion, adequate supplies of hay and silage for the wintering of stock should be secured. This will assist in building up our flocks and herds and promoting further production for next season. But allied to any drive for grass conservation, the necessity for seed production effort must be emphasised.

New Zealand is one of the finest grass and clover seed producing countries in the world. Without being egotistical, we can claim to the production of the best strains of grasses and clovers, and our unique geographical and climatic position makes us a grass growing country par excellance. Seed growing is the natural concomitant to grass production, and although we have done well in the past in seed production, there never has been a time in our history more so than the present in which a greater demand was made upon our farmers, who are urged to make 1940-41 a grass and clover seed production year.

Seeds for Britain

Britain needs seeds. She needs them badly, and it is our job to do what we can to meet her requirements. She needs cocksfoot in unlimited quantities, she needs ryegrass, white and red clover. It will be appreciated that many of her normal sources of supply have been cut off, that the European continent, which provided her with the most of her seeds, is now closed and she must seek elsewhere or her requirements.

An excellent opportunity exists here in helping the Mother Country and at the same time establishing on a firm basis an export trade in what might be virtually looked upon as a by-product of our pastures. It would appear that the demand for grass and clover seed will be very heavy during the coming season, and that apart from Britain's requirements, Australia and America will make large calls on our surplus exportable supplies.

Every paddock which can be closed up for seed-saving should be closed and harvested, particularly for Italian and perennial ryegrass, cocksfoot, and red and white clover. The prospects for such seeds as Chewings fescue and brown top are good, and special grasses such as timothy and crested dogstail should be seeded whenever possible. Grass strippers should be overhauled and made ready for the coming season, and farmers should now decide which fields they intend to harvest. It is needless to stress the profits in seed growing, particularly when it is "N.Z. Certified Seed."

My appeal to farmers, both North and South, is to make this a seed production year.

SUITS TO MEASURE

HALLENSTEIN BROS. LTD
HB
NEW ZEALAND

Regardless of the increasing prices of suitings and everything that goes into the making of suits, the 29 H.B. Stores are prepared to make to your individual measure a first-grade suit for only six and a-half guineas. Select your suiting now from a large range of fine quality English and New Zealand Suitings.

6½ gns.

BY BUYING NOW YOU SAVE 21/-

Hallensteins

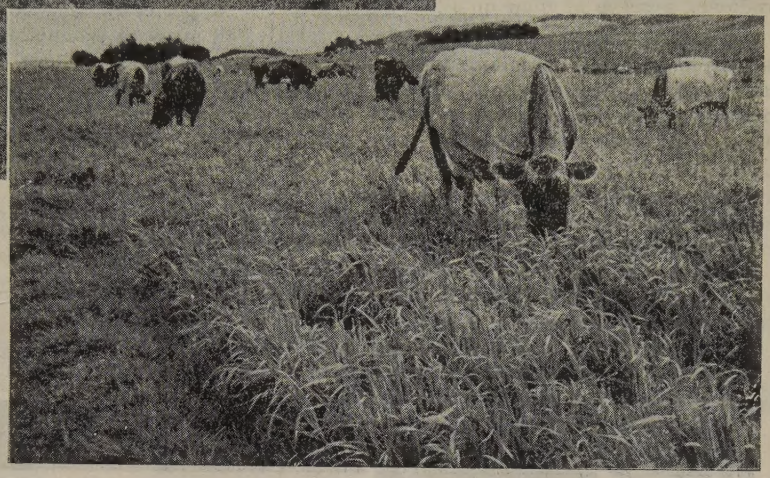
29 H.B. Men's Stores from Whangarei in the North to Invercargill in the South.

Control of Mastitis

Mastitis continues to be a cause of much loss of production among dairy herds not only in infected animals, but also from a culling or replacement point of view, states the annual report of the Director of the Livestock Division. The withdrawal of comparatively young cows because of mastitis, combined possibly with some other factor such as low production or irregular breeding, means a heavy replacement of producing stock every year. The field officers continue to give all assistance possible to owners who experience serious trouble in their herds. The prevention and control of the disease through herd and shed management must continue to be given first consideration.

Feeding Dairy Cows for Milk Production

— By —
N. LAMONT,
Instructor in Agriculture,
Masterton.



Above.—Good hay is far superior to hill country roughage for young stock and dry cows.

Right.—For early spring production Algerian oats cannot be surpassed.

N. Lamont, photos.

IT is an indisputable, if unpalatable, fact that the Wairarapa, possibly even more so than most other districts, "enjoys" the reputation for making inadequate provision for the supplementary feeding of dairy stock. This reputation does not simply imply that Wairarapa dairy farmers are relatively less competent than those in other districts; on the contrary, in fact, one must recognise that the big majority of Wairarapa dairymen do make far more provision for lean periods than is made in the main dairying areas.

What justice there is for this reputation arises from the fact that the district is relatively ill-favoured from the dairying point of view. So that, even in making relatively greater provision for supplementary feed than their more favoured brethren in northern districts, Wairarapa farmers do not entirely compensate their stock for the unfavourable dairying climate which is their lot.

In a normal Wairarapa season, considering the area south of Mount Bruce and excluding the narrow strip close to the Tararua Ranges, pasture production is adequate for only about three months of the year as the sole source of food for milking cows. That is to say, in order to feed a dairy herd adequately in the Wairarapa, provision should really be made for nine months' supplementary feeding.

Optimism Is No Ration

It is no doubt a truism that if there were no optimists there would be no dairy farmers, but this optimism is a source of weakness as well as a source of strength. In practice it is evidenced in the hope that the summer will not be as dry as usual, that the hill country man will have better grazing to spare than he very often has, and that the spring will be at least as early as it has ever been before. It is regrettably true that, with the possible exception of an early spring this year, Wairarapa optimists have been sadly disappointed over the past two years with respect to all three points, and production figures have clearly shown that from the cow's point of view optimism constitutes an inadequate ration.

The violent variations that do occur in seasonal conditions—for instance, 9.62 inches of rain in January or February, 1938, and 1.04 inches in the same months of 1939—make it imperative first of all that reserves of non-perishable supplements be established. On this point, one might say, the whole case for ensilage may well rest, as there is no substitute for this fodder when an exceptionally dry season calls for reserves of milk-producing supplements. For winter reserve, of course, hay is the obvious answer.

Reserves Necessary

That, then, is the first point that must be made—under Wairarapa conditions, where violent extremes are the rule rather than the exception, it is imperative that reserves of hay and silage equal to at least one season's

total requirements should be established. Perhaps a word is necessary to emphasise that such silage must be a first-class milk-producing product, which means that it must be made from a raw material on which the cows would readily milk if it were fed to them as a standing crop. On many farms in the Wairarapa opportunities for making this class of silage are rare. Many pastures and soils have not the quality necessary to produce a substantial bulk of leafy material, and usually the quality would be lacking unless the area were cut while the herbage was still inconveniently short. However, occasions can be found to convert an oat crop—cut really early—or the first cut of lucerne into a milk-producing reserve of high quality.

Assuming that adequate reserves have been built up, it remains to consider what is necessary to provide adequate supplements for an average season. Probably the simplest way to consider this subject will be to divide up the season into periods according to the special demands of dairy stock and the general level of pasture production and quality at different times of the year.

These periods can be conveniently taken as follows:—

(1) Late Summer and Early Autumn.

An examination of the returns of most Wairarapa dairy herds will reveal the fact that soon after the New Year their production declines fairly steeply. Sometimes there is a brief recovery with the autumn rains, but this would indeed merely emphasise the serious inadequacy of the summer feed position. A perfectly fed cow will naturally fall away in production after she has been in milk for four or five months, but this should be a gradual process if her feeding is adequate. On many Wairarapa dairy farms summer feeding is sadly lacking on the score of both quantity and quality.

(2) Late Autumn and Early Winter.

In spite of a normal autumn flush of grass, feed is rarely sufficient during the last few months of lactation. Cows are often already down in condition as a result of summer shortage, and their production plus the growing strain of the developing calf together constitute a serious drain on the condition and constitution of stock entering the winter.

(3) Winter—Dry Period.

As a reward for a season of good service the cow is turned out for her dry period to clean up the coarse, leached roughage on some sheep farmer's hills. While climbing the hills, digesting what is often little better than rubbish and nourishing a rapidly-growing calf, she is expected to build herself up in condition and health to

Bloat
HAS COST THE FARMER £250,000 A YEAR
● CAUSES—Sudden change of food, eating wet clover, oats, lucerne, etc.
● SYMPTOMS—Stomach enlarged, especially on the left flank; cow is distressed and breathing is rapid, reels when walking. If relief is not given at once, animal dies.
● TREATMENT—Administer half-pint "ETHODYNE." If abdomen still badly inflated within twenty minutes, repeat the dose. Give a "RED DRAUGHT" when cow is again normal.
OSMOND & Sons N.Z. LTD.
P.O. BOX 460 WELLINGTON

On medium to good country chou moellier is outstanding for late autumn and winter feeding.
H. Drake, photo.

Turnips are one of the best summer milk-producers.
H. Drake, photo.

withstand another heavy production season.

(4) Early Spring.

Most cows calve before the flush of grass comes away, and there is a period of about two months when the unfortunate dairy cow, freshly returned from a winter's hard scrub cutting, is expected to produce her maximum. An examination of herd testing sheets will again reveal the fact that few cows reach their flush production of milk in a month, as is normal for a properly fed animal, but may take three or more months to attain this maximum, and then are able to maintain it for no time at all before dry weather forces them into a steep decline.

Seasonal variations in production as revealed by herd test sheets are the best indication of the adequacy or otherwise of the food supplies. If a cow fails to reach her maximum milk production in about one month from calving, her winter and early spring food supply has been inadequate, and if she fails to maintain that maximum for two or three months at least further provision of succulent summer fodder is necessary.

Remedying the Position

In making the following suggestions for remedying the usual position, therefore, it is hoped that they will be studied in relation to individual circumstances as revealed by herd test or other records. In this way, any individual farmer can obtain a fairly accurate idea of how far these recommendations can apply to himself and how the areas and quantities given should be altered to suit his own circumstances.

(1) Provision for the Summer Period.

Omitting silage, which is more likely to be used as a reserve than as a regular source of summer feed, we have the following possibilities:—Soft turnips, millet, green maize, and lucerne, all of which will provide a good, succulent feed for the dry period. In spite of their susceptibility to disease and pest attack, soft turnips are probably the most popular. If fed only in the mornings and after wilting, no taint troubles will arise. On the lighter country as much as one acre to each five cows may be required, running up to one to 10 cows on better ground.

Millet and green maize are also very suitable where out-of-season frosts are

Cobaltised N-C-A Worm Drench
FOR THE TREATMENT OF *WORMS* IN SHEEP AND LAMBS
(Stomach, Intestinal, Tape and Wire Worms).
Contains Copper Sulphate (Bluestone), Nicotine-Sulphate, Arsenic and Cobalt combined in the correct proportions to act as a parasiticide. The medicinal dose of Arsenic also acts as a tonic. Cobalt has been found useful in small doses, especially in certain parts of N.Z.
Price 7/6 for 672 Lamb Doses.
Price 4/6 for 336 Lamb Doses.
Manufacturers:
TINGEY & HUBBARD LTD.
Chemists, FEILDING.

Farm-acy Earmarks
Guaranteed workmanship and materials. Any design made to order. REPAIRS made to cut like new. Free circular on application.

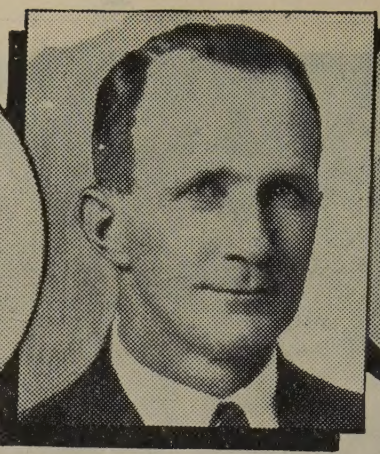
Farm-acy Eartags
As supplied to N.Z. Government Agricultural Colleges.
Will not rust, stain or pull out. Made of hard brass.
Send for Free sample and particulars.
Punch and pliers for inserting
Also Stocked or Manufactured: Tattoo Outfits; Burdizzo Castrators; Brands; Docking Irons; Ram Clamps; Bull Nose Punches etc., etc.,

THE FARM-ACY
(A. E. FOSTER, Proprietor)
23 MORRIS STREET,
PALMERSTON NORTH.
Phone 6081 - - Phone 6081

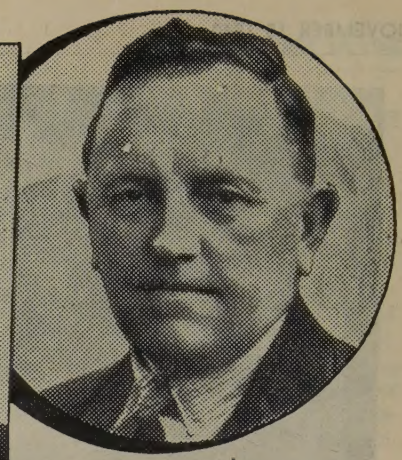
PRODUCE FOR VICTORY

SUCCESSFUL FARMING SERIES No. 3.

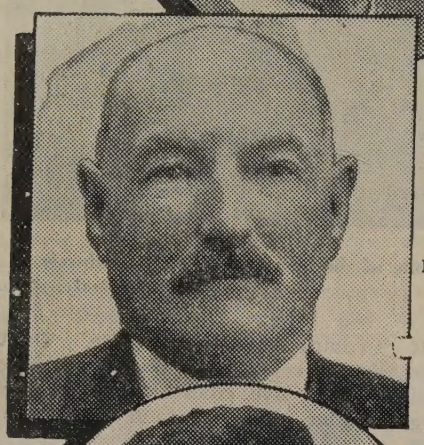
Mr. H. Wilson, Owner, 4,500 acres and 6,000 sheep, at Ngaruawahia.



Mr. G. W. Drew, Manager of Mr. James Seddon's Property, Ngapaeruru, Dannevirke.



Mr. W. J. Hillis, Seaward Downs, Southland.



Mr. D. Robertson, Romney Marsh Stud Breeder, Conical Hills, Gore.

Mr. A. M. Carpenter Southdown Stud Breeder, Fernside, Rangiora.

"We are Completely Satisfied"...

No more convincing evidence than this emphatic testimony of leading sheep farmers throughout New Zealand can be offered of the outstanding merits of GIESENS — SUTTONS and KARTET SHEEP DRENCHES, and the weight of such evidence is a strong recommendation to all farmers to ensure similar satisfactory results by regularly using GIESENS containing Tetrachlorethylene, SUTTONS containing Nicotine-Bluestone, KARTET containing Carbon Tetrachloride, or, in obstinate cases, a combination of GIESENS and SUTTONS which has proved itself a highly successful treatment.

LEADERSHIP IS THE REWARD OF MERIT . . . During their many years on the market, GIESENS, SUTONS and KARTET have been used for drenching many millions of sheep, and their universal use today is unassailable testimony that they do their job with complete satisfaction and utmost economy — HEALTH FOR THE SHEEP . . . PROFIT FOR THE FARMER.

SEND TODAY WITHOUT OBLIGATION FOR FULL DESCRIPTIVE DETAILS.

GIESENS • SUTTONS • KARTET

SHEEP DRENCHES

PREMIER PRODUCTS LTD. HUDDART PARKER BLDG. WELLINGTON

NEW ZEALAND MANUFACTURERS AND DISTRIBUTORS

You can order or obtain supplies through any stock firm or merchant, but here are the names of our agents, who carry supplies to fill your requirements. Support them where possible.

Kash Traders Ltd., Ruatoria; Alfred Buckland & Sons Ltd., Auckland and branches; G. W. Vercoe & Co. Ltd., Hamilton; Hughes' Hardware Service Ltd., Te Kuiti; S. Christmas Ltd., Taumarunui; Newton King Ltd., Ahura; Farmers' Co-operative Org. Society of N.Z. Ltd., all Branches, Taranaki; J. D. Bell, Gisborne; Hawke's Bay Farmers' Co-op. Assn. Ltd., all Branches, Hawke's Bay; Levin & Co. Ltd., all Branches; W.F.C.A. Ltd., all Branches, Wairarapa; New Zealand Farmers' Co-op. Distributing Co. Ltd., Marton; Andrews & Beaven Ltd., Christchurch, Ashburton, Timaru, Invercargill; D. S. Bain, Oamaru; Donald Reid & Co. Ltd., Dunedin and Branches; Reid & Gray Ltd., Gore, Invercargill.

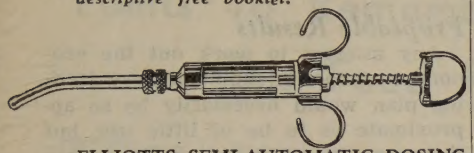
Elliotts

SHEEP DRENCHING INSTRUMENTS

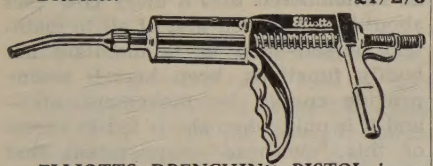
For increased production the gamble must be taken out of drenching. Elliotts new improved drenching equipment ensures absolute safety by administering exact doses, it ensures positive efficiency by perfection of its construction, it ensures utmost economy by drenching more sheep per hour. Labour is saved . . . time is saved . . . Drench is saved . . . Money is saved . . . Sheep are saved by using Elliotts equipment which functions with absolute accuracy and certainty

Precision made with non-corrosive materials, Elliotts instruments give the perfect and lasting service every farmer needs . . . and by means of the definite savings enumerated, their initial cost is also very soon saved.

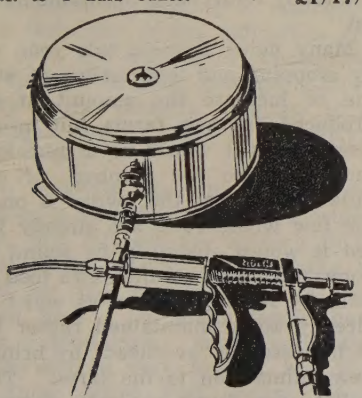
Write to Premier Products Ltd., Sole Distributors, for fully illustrated and descriptive free booklet.



ELLIOTTS SEMI-AUTOMATIC DOSING SYRINGE: Dose range 2½ c.c. to 10 c.c., specially recommended for administering Carbon Tetrachloride and Tetrachlorethylene Drenches. **£1/2/6**



ELLIOTTS DRENCHING PISTOL incorporates the safety flow nozzle and special everlasting rubber plungers. Dose range 5 c.c. to 1 fluid ounce. **£1/17/6**



ELLIOTTS AUTOMATIC DRENCHING GUN, complete with container, rubber tubing, straps, cock and carrying case. Dose range 5 c.c. to 1 fluid ounce. **£6/10/0**

Agents and Stockists Opposite.

not too risky; millet will do well on quite light, stony country, although maize requires rather better conditions. These crops are found convenient to follow swedes where club root makes turnips inadvisable, and have the further advantage that, should a very good season result in a surplus of summer crops, they can be converted into hay or silage. As a sole source of summer feed one acre to each eight to 12 cows should be grown.

Although the stand is usually the worse for the treatment involved, there is no doubt that green lucerne is an ideal dry weather food for milking cows. Provided it is wilted before being fed, there is no risk of bloat, and its high nutritive qualities place it in a class by itself. With the exception of lucerne, the crops named are all relatively deficient in protein, and although their succulence makes them well worth while in dry weather, one feels that even better results could be obtained if a protein-rich supplement could be added—for example, lucerne or even a meal, fed in the bails, consisting mainly of pea-meal, linseed-meal, or something similar.

(2) Provision for Autumn and Early Winter.

Later varieties of yellow fleshed turnip can be used to provide for this period, and on all but the lightest country chou moellier is first class. Although relished greatly by the white butterfly and similar pests, chou moellier has shown itself capable of good recovery from attack and is equally relished by stock.

The amount of grass available at this period varies tremendously in different seasons, and again the amount of feed provided earlier will affect the cows' requirements, so that it is difficult to suggest even an approximate area that should reasonably be required. As a general rule, however, one acre to about 15 cows of chou moellier or turnips should suffice until the cows are dried off.

(3) Winter—Dry Period.

There is undeniably a very regrettable tendency among many dairy farmers to regard a dry cow as deserving of little care or consideration. The standard practice of turning dry dairy cows out on rough hills rarely merits anything but the strongest condemnation. On light Wairarapa country, pugging is not often a serious consideration, but even if it is, every endeavour should be made to see that cows are wintered in a good sheltered situation, sufficiently convenient to home to enable hay and roots to be fed.

There is no doubt that many stock troubles, as well as low production, in the early spring are directly the result of malnutrition during the dry period. It is agreed that a bulky, warmth-producing ration is appropriate at this time, but it is essential that this ration, although bulky, contains more real nutriment than is to be obtained from the usual type of hill country roughage. Good hay and roots are not only necessary, but highly profitable.

Generally, about three-quarters of a ton of hay per cow cut from, say, half an acre, and about an acre or two of mangolds for 50 cows would not be too much for this period, remembering that a dairy cow will soon milk off any condition she might acquire when dry.

(4) Provision for Early Spring.

Where cows calve in early August, they should be producing their maximum milk during September, whereas grass is rarely sufficient until mid-October. Really good hay and mangolds will provide for this period, but it is frequently found that a green cereal is more acceptable. The area of, say, oats sown will depend again upon the amount of hay and roots saved and upon the time when a flush of grass is normally experienced in the district, but probably one acre to 10 cows would be the rule. Such an area of oats can later be converted into silage or hay, and makes a good product if cut really early.

Summary

As mentioned previously, the actual areas given are very approximate, and can be taken only as a rough guide. It is suggested that, as a sound practice, every endeavour be made to establish non-perishable reserves in the form of silage and hay. These will be a safeguard against crop failures and against flush seasons when crops are partly wasted. Although necessary in the Wairarapa, crops which cannot be converted into reserves should be kept at a minimum.

As a rough guide, the following scheme is suggested for a herd of 50 cows:—

(1)—For Summer Feeding.

(a) Five acres of soft white turnips.

(b) Three to five acres of millet, green maize, or lucerne (in addition to turnips).

(c) The feeding of small quantities of protein-rich meal in the bails is recommended as well worth a trial for the best cows at least.

(2)—For Autumn and Early Winter.

(a) Three or four acres of chou moellier or late turnips.

(b) Probably some hay towards the end of the period.

(3)—For Winter Dry Period.

(a) Twenty-five acres of hay.

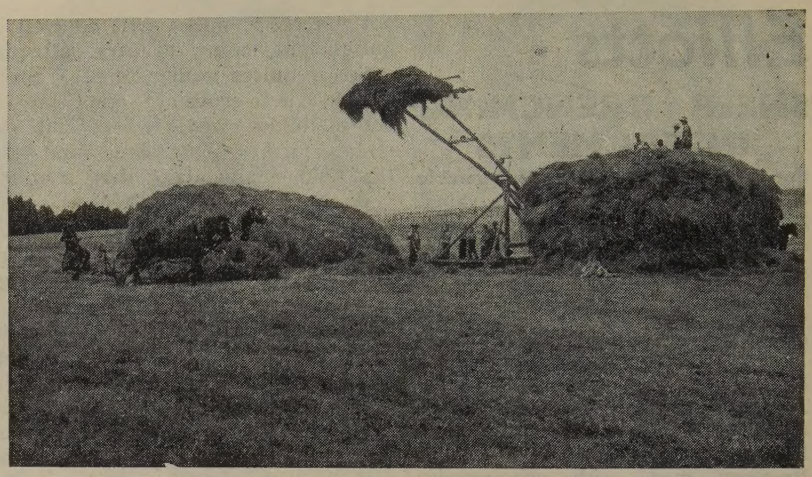
(b) One or two acres of mangolds (in addition to hay).

(4)—For Early Spring.

(a) At least five acres of green oats. (This area will depend on the quantity and quality of the hay that could be saved.)

(b) This is another period when the feeding of concentrate meals is likely to be a profitable venture.

This plan should serve as a rough idea of what is normally required in the Wairarapa, although on some of the poorer country, the areas may need to be increased, and on the best country they may be a little on the high side. Such a scheme does not involve an excessive amount of ploughing, as two or three crops can be taken from the same area, preferably so long as at least one fed-off crop is included.



Every farm should establish substantial reserves of hay.
H. Drake, photo.

Profitable Results

Any attempt to work out the economics of such a supplementary feeding plan would necessarily be so approximate as to be of little use, but there can be no doubt of the highly profitable results that must accrue from more adequate feeding. It must be remembered that a dairy cow uses about half her food first of all to maintain herself—that is, to maintain her bodily functions, keep herself warm, provide energy for movement, etc.—and it is only when she is fed in excess of this "overhead" requirement that she will produce. In other words, any feeding in excess of maintenance is directly returned as profitable butterfat.

Many dairy farmers this year will, by cropping and topdressing, be striving to increase the amount of feed produced on their farms, but in very many cases it would be a mistake to increase also the number of cows milked. Unless the owner is one of the few whose cows are already fully fed it would obviously be sound economy to convert all the extra feed into milk by feeding it to cows which are already being maintained rather than to increase his "overhead" by bringing new animals on to the farm. There will be few farms on which increased feed supply without increase in herd number will result in the stock becoming fat during the milking season.

Ensilage Is A Savings Bank For Fodder

Points To Remember In Making This Feed Reserve

By J. E. BELL,
Instructor in Agriculture, Auckland.

THE war in Europe has turned the attention of farmers in England increasingly to the value of ensilage as a fodder for dairy cows and for the production of milk. The reduction in supply of imported stock food is being offset by growing extra food to take its place on the farms in the Old Country. This is being brought about mainly by the growing of crops and partly by increased attention to the production of ensilage. The farmers in England are looking to ensilage to help them out of the difficulties arising from the scarcity of concentrates. To farmers in New Zealand, particularly dairy farmers, ensilage is no stranger, and its value as a fodder is well recognised.

To maintain high production, cows require a plentiful supply of succulent food, and farmers are striving to increase this supply by ploughing up land for the growing of roots and green feed. On many farms, however, ploughing and cultivation work will be very limited, and it is on these farms that ensilage is of greatest value. On such farms the making of hay and silage must be exploited to the full, the aim being to save all the surplus spring grass growth and allow none of it to become rank and uneaten and therefore unproductive.

Alternative Food

Ensilage should also play its part on farms where a fair amount of fodder crops are to be grown. The farmer will then have an alternative succulent food, which is so essential for milk supply. Weather conditions may be unsuitable for the production of crops in sufficient amounts, and in such seasons pasture growth is often poor. If both pasture and fodder crops fail, production will certainly slump unless ensilage, saved that season or in a previous season, is there to replace the shortage.

The ensilage pit, silo or stack serves as a savings bank for succulent fodder, to be drawn on when the pastures or crops have failed to do their part. In the coming season many dairy farmers will be growing crops for summer and winter use, and if they are wise they will also make some ensilage and thus be all the more certain of maintaining or increasing the production of their cows.

Thus, the ensilage pit, silo, or stack serves as a savings bank for succulent fodder, for there are no other means of preserving such feed. Such a savings bank can be drawn on when the pastures or crops have failed to do their part. Ensilage keeps best when completely enclosed in a pit or silo; in a stack decay proceeds until the rotted material at the sides results in a natural sealing-off.

In the dairying districts of New Zealand the food provided by grazing pasture is the main source of supply. There are two periods when this supply fails—in winter from June to September, and in summer from January to March. In winter both succulent and dry fodder are required, but in summer there is usually a supply of dry grass and only a succulent supplementary food is required.

Ensilage from Crops

In the coming season many dairy farmers in New Zealand will be growing crops for summer and winter use. If they are wise they will also make some ensilage, and thus be all the more

Photo above. — Consolidating an ensilage stack.
C. S. Dalgliesh, photo.

certain of maintaining or increasing the production of their cows.

Some of the crops which are grown for summer use may not be required, and any cereal or leguminous crop, such as maize, millet, barley, or peas, can be made into ensilage if this is the case. Maize, being coarse material, is difficult to stack so that air does not penetrate and cause much decay. This can be obviated to a great extent by stacking alternate layers of maize and grass or peas or other fine material. In a pit or silo the maize should be chopped with a slasher or chaffed, after which treatment it can be properly packed.

The making of grass ensilage has encountered much opposition from some of the more conservative farmers. Ensilage has been accused—unjustly—of causing all kinds of stock diseases and even the death of animals. There appears to be less danger in feeding ensilage than in feeding hay, roots, or green feed, with the attendant dangers of impaction, choking, and red water. The quantity of ensilage which can be fed to cattle appears to have no limit. The chief danger appears in not feeding enough, a good rule being to feed as much as the cows will clean up. A cow requires 30 to 60lb. of ensilage in winter in addition to her hay ration and in summer in addition to pasturage. The amount depends largely on the water-content of the silage, which varies considerably.

Points to Remember

Before making ensilage, the following points should be remembered:—

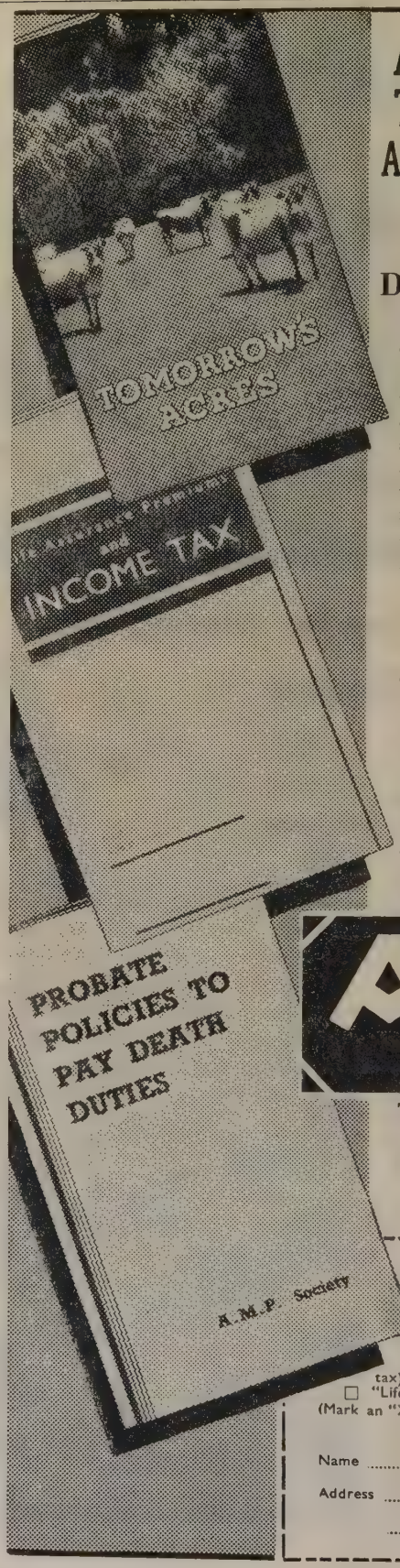
(1) Pick a field containing early grasses and clovers. A good rye-white clover-subterranean clover pasture is ideal.

(2) Topdress with a suitable fertiliser or fertiliser mixture.

(3) Shut up early so that it can be cut early.

(4) Cut not later than when the ryegrass or chief early grass present appears in flower.

Late cutting results in a heavier crop of more fibrous material and of lower feeding value per acre and per plant. Cutting before flowering results in lower yield or better quality fodder than in the flower stage. The advantages of early cutting are obvious—less damage to pasture and better after-



AN A.M.P. SERVICE TO BUSINESS MEN AND MEN ON THE LAND

Vital Information on Death Duties and Income Tax Exemptions

The A.M.P. have recently instituted a Service and Information Department, which provides without cost or obligation, expert advice and literature on business and taxation problems solved by life assurance. For instance, do you know the rates of Income Tax and the maximum exemption allowed by law on life assurance premiums for Income Tax purposes? Do you fully understand Death Duties, and the amount of ready cash it is necessary for you to provide to keep your estate intact for your beneficiaries?

The Booklets illustrated explain these subjects simply and concisely. They enable business men and farmers to approach the problems of Income Tax and Death Duties with real knowledge of these subjects. These booklets are available without cost or obligation—just fill in and post the coupon below for whichever booklet or booklets interest you.

A.M.P. SOCIETY

THE LARGEST MUTUAL LIFE OFFICE IN THE EMPIRE
Established 1849 (Inc. in Australia)
Head Office for New Zealand:
Customhouse Quay, Wellington.
W. T. IKIN, Manager.

The Service and Information Dept.,
A.M.P. Society, Box 1464,
WELLINGTON.

Please send me without cost or obligation your booklets marked "X"—

☐ "Tomorrow's Acres" (A booklet for farmers covering death duty and income tax), ☐ "Probate Policies to pay Death Duties," ☐ "Life Assurance Premiums and Income Tax."

(Mark an "X" in the square in front of the booklets that interest you.)

Name .....

Address .....

.....

AMP6

Left.—The tumbler sweep approaching the pit.
C. S. Dalgliesh, photo.

Right. — The tumbler sweep after negotiating the runway arrives on top of the material where its load will be deposited.
C. S. Dalgliesh, photo.

math growth, as well as superior fodder.

The greatest feeding value will be obtained from cereals cut when the grain is thickening from the milk to dough stage. From legumes, such as peas and tares, it is obtained when cut between blooming and early podding. The first crop of lucerne should always be cut for silage, and in wet summers subsequent cuts are safer made into ensilage.

Harvesting the Material

At harvesting time the material must not be allowed to dry out unduly, especially when finishing off the stack. Material cut early in the morning should be stacked that day, and material cut in the afternoon should be harvested before midday next day. If the material is dry or coarse, such as unchaffed maize, or if harvesting is carried out at a dry period, the material should not be allowed to wilt, and only a small area should be cut at a time to allow this to be carried out. Wilting is advisable when ensiling wet young material for placing at the bottom of the stack.

Freshly-cut green grass is heavy, being about three times as heavy as hay, and therefore the less forking and lifting required in handling it the better. For short distances the tumbler and dandy sweeps have proved efficient in picking up from the swathe. The wagon hay loader is very effective, but is beyond the pocket of the average farmer. The sweep attached to the front of old motor-cars or tractors makes for very speedy work.

The difficulty in picking up wet green material is that it sticks and will not slide back on the prongs of sweeps, and for this reason the tumbler and motor-car sweeps have short prongs. If sweeps with long prongs are used they must be made so that the prongs lie flat on the ground, so that the material, once on the sweep, does not have to be forced up any grade as the sweep gathers more material. The "dandy" is such a sweep. Mechanical stacks as used for hay are necessary in building stacks, otherwise labour costs will be unduly high.

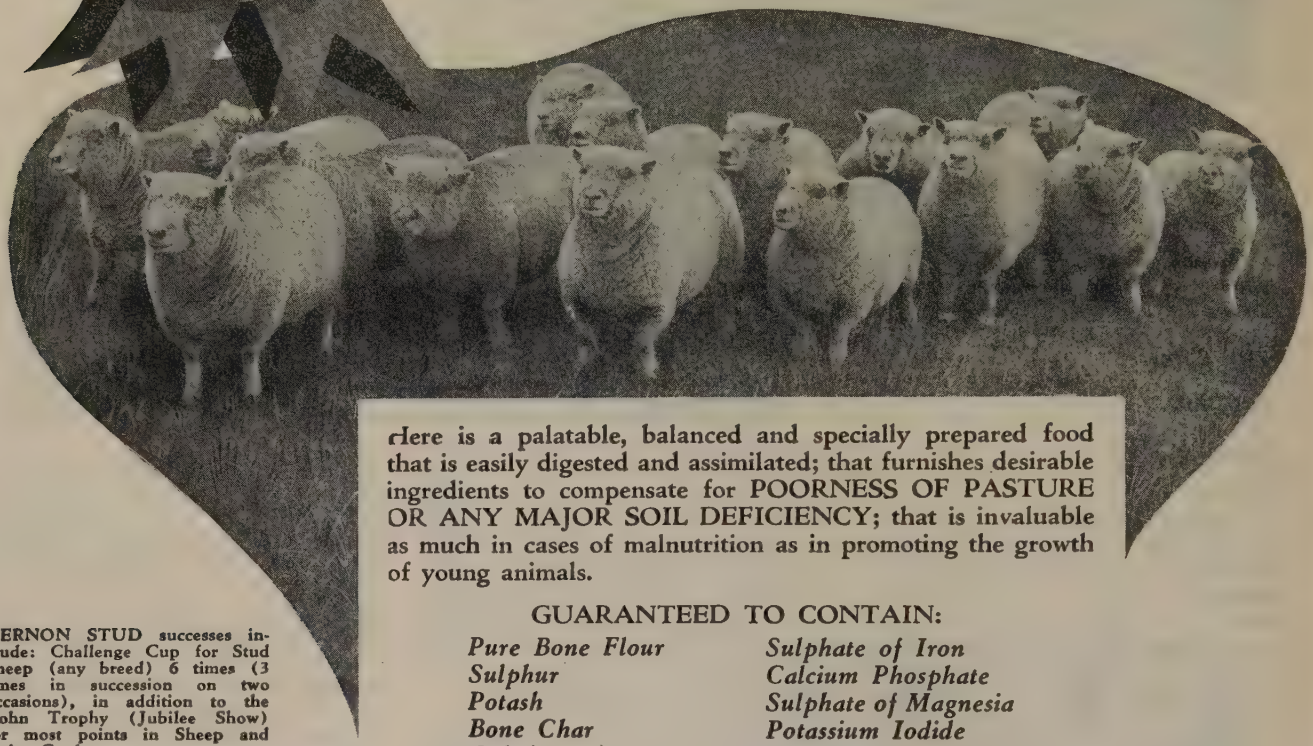
Process of Ensiling

Except for a halt of one or two days after the first cut is harvested, the material should be stacked as continuously and quickly as possible. The rule is speedier harvesting at the finish with more time taken at the start of each stack. If the material is dry or coarse, or if harvesting is carried out at a dry period of the year, speed is essential; no time should be lost, and close attention should be paid to trampling and even stacking to exclude

SOOTHE AND HEAL SORE TEATS AND UDDERS
with PATTEN'S
MILKEEZE
Obtainable from all Chemists and Stores in 1-lb. and 36-lb. tins, also 4-lb. billies.

Champions!

The outstanding Southdown ewes shown below, property of MR. GEO. HUTCHINSON, Vernon Stud Farm, Wharepapa, were fed on "WONDER" MINERAL STOCK FOOD.



Here is a palatable, balanced and specially prepared food that is easily digested and assimilated; that furnishes desirable ingredients to compensate for POORNESS OF PASTURE OR ANY MAJOR SOIL DEFICIENCY; that is invaluable as much in cases of malnutrition as in promoting the growth of young animals.

GUARANTEED TO CONTAIN:

Pure Bone Flour	*Sulphate of Iron*
Sulphur	*Calcium Phosphate*
Potash	*Sulphate of Magnesia*
Bone Char	*Potassium Iodide*
Cobalt	*Charcoal*
Salt	*Meal*
Limonite	*Molasses*

VERNON STUD successes include: Challenge Cup for Stud Sheep (any breed) 6 times (3 times in succession on two occasions), in addition to the Kohn Trophy (Jubilee Show) for most points in Sheep and Dairy Cattle.

At the Auckland A. & P. Show in February, with one exception, EVERY SHEEP THAT WON A CHAMPIONSHIP WAS FED ON "WONDER" MINERAL STOCK FOOD — A CLEAR-CUT RECORD OF ITS KIND.

WONDER MINERAL STOCK FOOD

Manufactured and Distributed by WONDER DISTRIBUTORS LTD., P.O. Box 129, Feilding.

FACTORIES AT PALMERSTON NORTH AND CHRISTCHURCH.

Feeding out ensilage from a stack.

C. R. Taylor, photo.

air. Before the stack is finished the heart should be filled so that it is slightly higher than the outside, resulting in the top of the stack being shaped like an inverted saucer.

Covering the Ensilage

The earth covering should be applied immediately harvesting is completed. Earth alone makes an ideal seal. Do not place straw or material which is likely to contain air or let in air between ensilage and its contact with earth or concrete. It is a good practice to fix a frame of some sort around the stack to hold the earth. This frame should be kept as near the edge as possible, for the nearer pressure can be brought to bear on the edge, the less will be the wastage of the exposed side of the stack.

If loose earth is simply laid on the stack, much of that laid on the edge will fall off, leaving the sides insufficiently consolidated; air may penetrate far into the sides, and much waste will occur there. Instead of a wooden framework or logs tied in position, bags filled with earth are often laid around the stack edge, and frequently wire-netting is used. One edge of the wire-netting should be placed on the edge of the stack and kept in position by earth shovelled on top of it. While this is being done the other edge is left to hang down the side of the stack. It is then lifted up until it is above the other edge and held there by wires running across the stack.

The stack should be watched for a week or two to see that it settles evenly. If settling is uneven an attempt should be made to right it by removing earth from less consolidated to more consolidated parts, but this must be done early before the incline is too great.

Recently some farmers have made grass ensilage without a weight cover, and some ensilage has been made in this way with not more than three inches waste on top. Apparently success depends greatly on weather conditions and the succulence of the crop when harvested. If the pasture is at a young stage and the weather moist at the time of harvesting the material packs closely and become air-sealed. If the material is dry, and therefore does not pack well, the lack of weight of the earth will result in overheating and more decay. The lack of earth cover will also make for more waste where coarse material, such as unchaffed maize, is ensiled.

Methods of Making Ensilage

Ensilage can be made in a stack, pit, or trench, or in a silo. In North America ensilage is usually made in a silo, but in New Zealand the stack or pit is most common.

In building ensilage in a stack the sides should be kept perpendicular. The material is applied evenly, but at the end of each day—and particularly at the finish—the centre is heaped high, and is heaped to a higher peak where no covering is to be applied. The earth covering should be applied as soon as building is finished. A very well built and covered stack will have only 3 inches to 6 inches waste at the sides and none elsewhere, but the average stack has 12 inches waste at the sides.

As there is less area of side exposed per ton of material ensiled in round stacks, it is preferable to build stacks of that shape. The stack has advantages over the pit or concrete silo, for by making ensilage in the stack a farmer may make ensilage in any field on the farm. It is easy to feed out from a stack, and there is less mud to contend with. Compared with the pits, its disadvantage is the greater difficulty at harvesting time in lifting the heavy green grass, although on farms equipped with stackers this presents little trouble.

Building ensilage stacks is also difficult because of the uneven heating caused by wind. The lee side of a stack heats more quickly and sinks more rapidly. A sheltered spot, therefore, should always be picked as a site for an ensilage stack wherever possible.

Silos

Silos may be of any building material, but they are usually made of wood or concrete, the latter being more satisfactory. The silo possesses the disadvantages of the pit in being fixed in position without its advantages in labour-saving. In North America the fact that the silo is fixed in position is no disadvantage, because all

PUT AN END TO PRIMITIVE METHODS—
Get Gallons of
BOILING WATER
THIS QUICK MODERN WAY
With a SPEEDWAY Steam Steriliser you can raise a full head of steam in under 15 minutes, plus unlimited gallons of boiling water.
SECURE FULL DETAILS

Enquire from your Agent or send for leaflet.

SPEEDWAY

OIL (OR WOOD) BURNING STERILISERS,
SPEEDWAY STEAM PRODUCTS LTD.,
51 Albert Street, Auckland.

South Island Distributors:
A. H. Turnbull & Co. Ltd., Christchurch.

the silage is fed to cattle in central farm houses. The maize which is chaffed for ensilage requires a container and cannot be stacked, and so a pit or silo is used.

Pits or trenches can be dug out of a tableland of almost any height, although they are generally dug out of a tableland about six to eight feet high. In selecting a site, particular care should be paid to the convenience for filling and emptying. Shallow pits are better because of the greater ease of emptying when the entrance becomes muddy and unworkable, although they entail more work in filling and covering than deep pits. Pits are made of many shapes, the best being those which converge to the entrance. The plans of these pits may vary in shape from circular to horseshoe to something like a sloping-shouldered bottle. The sides are usually battered somewhat, and any corners should be rounded. A trench pit can be made on level ground with a run-out at one or both ends.

The Run-outs

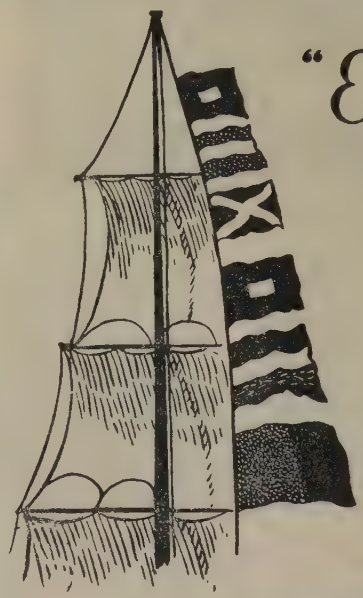
The run-outs slope gradually upwards from the floor of the pit. Wherever possible, one run-out should front a hollow or low situation to facilitate loading and carting out when feeding. The trench is usually made four to five feet deep and the sods of the turf from the top of the evacuated area can be used to increase the height of the walls along each side. Making only one outlet leaves a back wall of four to five feet in height.

When ensiling begins a few loads are tipped in the pit, and consolidation is afterwards increased by driving the horses over the ensilage in the pit as they deliver their loads. This type of trench on level ground is suitable only on country where the water-table is low in the winter. It has been found suitable in the Rotorua district, where the soils are generally very light.

Another type of trench is simply a cutting through a hill, made just as a roadway cutting is fashioned, with battered walls and a crowned roadway. It is easily constructed with plough and scoop, and is easy to fill and easy to empty, as there are alternate ends for emptying. It is better to make the trench wide if sledges are used so that the horse can turn the sledge in the pit when feeding out. Narrow, deep trenches are troublesome to empty, although easy to fill.

Crumbling Walls

The chief trouble with pits and trenches is the crumbling of the walls, which therefore have to be trimmed each year. This crumbling is encountered in country where the soil is of a clay nature. After a time with continuous trimming the pits may become rather large, and concreting or cementing the walls then appears to be the only remedy. In such country it may be preferable to make ensilage in stacks.



"*England Expects*—"

and urgently needs—

more cheese
more bacon
more wool

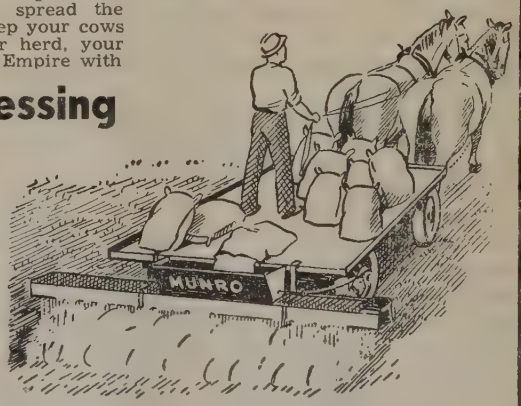
New Zealand's great drive to help our Motherland is on. Whether yours is a high- or a lower-production farm.

YOU can help by making

more HAY, more ENSILAGE

This year you are urged to grow the extra bit of milk-producing feed that will spread the "grass saving" season. Keep your cows in milk longer; help your herd, your financial position, and the Empire with

more Top-dressing



Do your top-dressing

without
extra labour.

Mr H. P. McLeod, Helensville, says: "The Munro is without a doubt the best machine on the market. It mixes perfectly. This Autumn we have sown 1000 acres, and our repair bill was 10d (tenpence). What other machine will do this?"

Get the labour-saving facts about

The Munro 'TRIUMPH' Top-dresser

from your nearest agent,

or from
N.Z. DISTRIBUTOR:

J. M. McCrostie
Holloway House,
INVERCARGILL

Write for FREE booklet 12

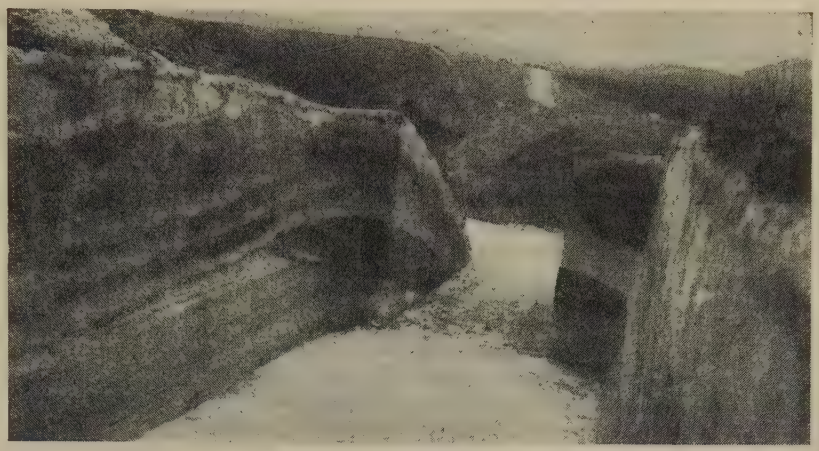
W. E. Lewisham Ltd., Anzac Avenue, Auckland. Wellington: N.Z. Farmers' Co-op. Distributing Co. Ltd., Feilding and branches. Taranaki: Farmers' Co-op. Organisation Society, Hawera and branches. Hawke's Bay: G. M. Spencer, Hastings. Canterbury: Skilling's Implements, Christchurch and Rangiora. Westland: Dalgety & Co., Ltd., Greymouth. Nelson: Dalgety & Co. Ltd., Nelson. Marlborough: Wright, Stephenson & Co. Ltd., Blenheim.

Pits and trenches should be large enough for the material to sink beneath the ground surface, thus leaving no material exposed to the air.

If a spring is struck in digging the pit or trench the site should be abandoned. Good ensilage can seldom be made in such pits, even when measures are adopted to drain away the spring.

A well-constructed pit or trench is superior to the stack in that less labour is required in filling, and, further, by boarding up the front complete air exclusion can be obtained. Using a pit, the ensilage harvest can be arranged on most farms without the need for outside manual help.

The filling of pits and trenches need not be carried on as fast as harvesting into stacks, because there is less air circulation to cause heating. Especially is this so when the horses trample over the harvested material in delivering the loads.



Ensilage pit. Note the batter on the walls, the narrow entrance, and rounded corners. *C. S. Dalgliesh, photo.*

Possible Losses

If correct methods of ensiling are carried out in the stack there is no wastage except for an inch or so at the top under the earth and about twelve inches at the sides, where the wastage is largely loose material, and is very little compared with the bulk of the stack. If the stack sides are pulled as building goes on the waste there can be cut down to as low as three or four inches.

Wastage at the side is greater or less according to the pressure. It is important, therefore, to place bags of earth or wire-netting or a framework of wood close to the stack edge so that plenty of earth can be made to bring pressure to bear on the sides. The sides should also be perpendicular, for if they incline to the centre of the stack less pressure can be brought to bear on them.

If the earth is not applied soon after ensiling the material near the top is liable to overheat, particularly if it is inclined to be dry. Therefore, rakings from the field should not be used to finish off ensilage stacks. Air will penetrate overheated ensilage further and more rapidly than succulent ensilage. If the material is dry and the earth application is delayed unduly, waste in the higher portions of the sides and on the top under the earth will be considerable, amounting frequently to 2ft. 6in. from the outside and extending 1ft. below the earth cover. Wastage of the ensilage at the side near the bottom of the stack is usually less than higher up, and even in the brown type of ensilage seldom amounts to more than 18 inches The earth cover does not affect greatly the amount of wastage there.

One might say that waste at the bottom of the stack, where the material finds contact with the earth, never occurs, for air exclusion there is most complete. If, however, loose straw or branches of trees or similar material is laid as a foundation for an ensilage stack, air might penetrate and cause rotting, but ensilage is usually placed on concrete or earthen floors, and under such conditions no waste at the bottom is liable to occur.

Wastage in Pits

The amount of wastage in pits depends on the exposure of the ensilage, and may also be caused by delay in the application of the earth cover. If the ensilage does not sink completely into the pit and find firm contact with the walls soon after ensiling is complete, the portions of the sides which were thus unduly exposed to air will rot. Also, if the ensilage at the mouth of the pit is exposed, it will waste there. One commonly finds in pits a little wastage at the sides near the top even where the ensilage has sunk into the pit and found firm contact with the walls, because decomposition has set in before the ensilage has settled. Wastage at the exposed front is usually not of much importance, although it can be prevented by boards placed at the mouth of the pit and held in position by stayed posts sunk in the ground.

If the ensilage pit itself is deep and is dug only a short distance into the bank and the mouth is wide and so shaped that there is no resistance to the slumping forward of the ensilage and there are no boards, posts, and stays to prevent it doing so, the ensilage will leave a gap at the back of the pit which, letting in air, will cause waste as far as it can penetrate. In being made, ensilage shrinks in all directions; the higher the temperature attained the greater the shrinkage. Therefore, in pits and silos with perpendicular walls there is a tendency for a gap to form between the walls and the silage, also letting in air and causing waste. I have seen ensilage in concrete silos with a wastage of 2ft. 6in. at the sides near the top, taper-

S. OPPENHEIMER & CO., INC.
(Incorporated in U.S.A. as a Limited Liability Company)
Established 1868 in New York, 1892 in New Zealand.
SAUSAGE CASINGS
Manufacturers and Exporters of New Zealand Casings. Importers of American Hog Casings.
Office: 38-42 The Terrace, WELLINGTON.
P.O. Box 350. Telephone 43-373

ing down to no waste at the sides over half-way down.

Effect of Weather

As silage in concrete silos and pits with straight walls can be made so that this gap does not occur, there must be some technique in filling and tramping the material which will obviate the waste so caused, but what this technique is I do not know.

If ensilage is exposed to the weather, as in stacks and open pits, it is important to heart up the material high at the finish so that no large depressions are formed which will collect so large a volume of water that it penetrates the earth cover and ruins some of the ensilage beneath. The earth cover not only serves to weight the ensilage and prevent overheating, but later when the stack has settled it serves as a seal to exclude air and rain water, the latter being partly shed by the sloping sides and partly held as a sponge holds water until evaporation can take place.

Feeding Out

Ensilage will keep as long as it is kept airtight. In stacks of ensilage, loss increases as the rotted material at the sides falls away, exposing fresh inner material to the atmosphere. At the same time, the cover of earth, unless attended to, will fall away at the edges as it is undermined by the falling away of the rotted material at the sides. If care is taken to keep the earth cover intact the rate of wastage is low, and ensilage in stacks will keep fairly intact for twelve months. In pits and silos where the material is completely sealed by earth or walls there will be no waste as long as the cover is not disturbed, but where the ensilage is exposed the material will rot.

Ensilage can probably be used as soon as it is harvested, but usually it is not necessary to feed it until one month after ensiling is finished. It is then quite safe to feed to stock.

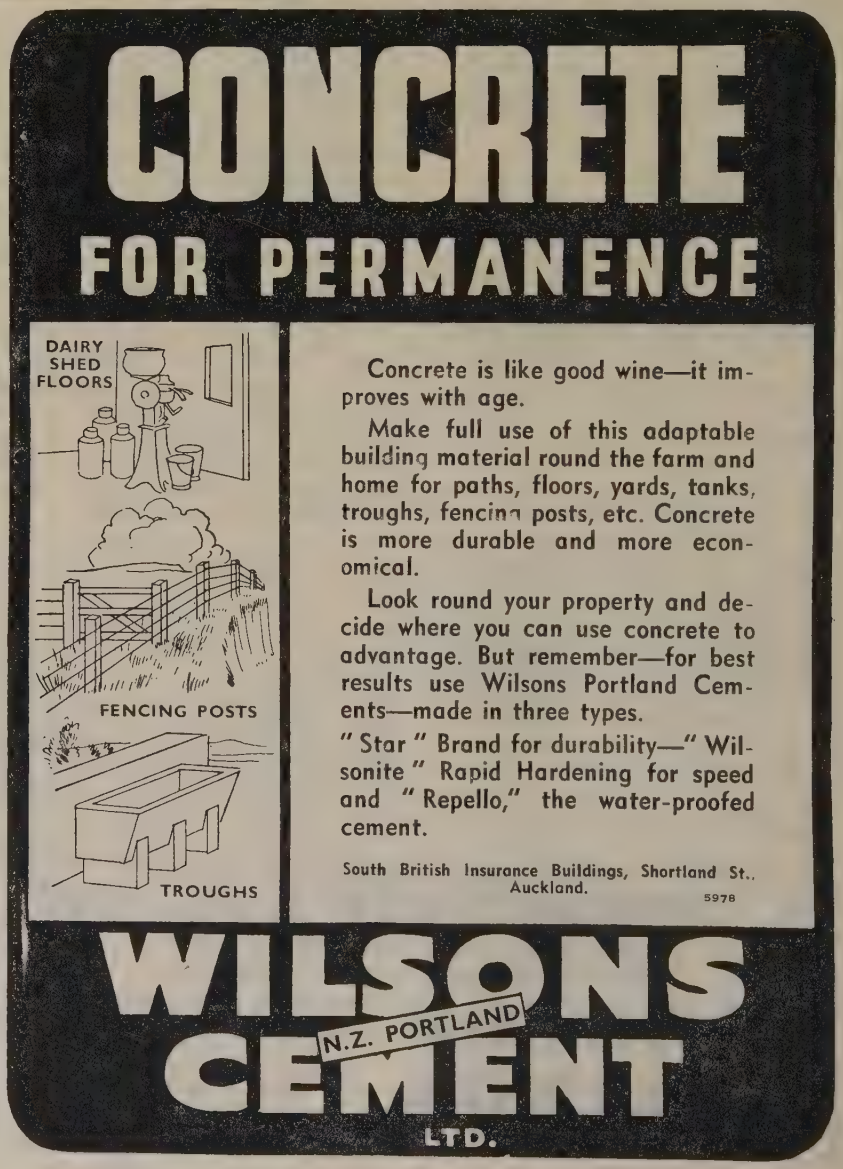
Ensilage begins to decompose as soon as it is exposed to air. In feeding out from small stacks, pits, and in silos, all the earth covering is usually thrown off and the material is removed in layers from the top, working downwards. Where there is a large bulk of material in the stack or pit the ensilage is usually removed in sections to save labour in forking long distances to the cart or sledge. The ensilage is cut by means of a hay knife, sharp spade, or a special spade-like implement with a very sharp edge.

Cutting the Ensilage

First of all, the earth is removed from over the section to be fed out, a cut is made, and the material cut away from the mass of ensilage is forked into the sledge or cart. The earth on the remainder of the material is left intact. By the time the section is all fed out the wall of the exposed cut may have rotted near the top of the cut about 6 inches to 12 inches inwards. Further down the wall, where the pressure is greater and the material is usually more sour, the wastage is but slight and often negligible by the time it is fed out.

The waste caused by making cuts into the ensilage mass is therefore not great, and if it saves labour in forking it is not worth consideration. However, if the ensilage mass is small and the extra forking entailed is not laborious or is nearly counterbalanced by the work entailed in cutting, it is better to remove the ensilage from the top, taking care to fork material from all parts at each feeding out so that none of the material is exposed for long before feeding out.

Ensilage should be fed out as fresh as possible. Therefore, it is advisable to feed out some ensilage each day and not to feed greater quantities to last for two or more days.


CONCRETE
FOR PERMANENCE
DAIRY SHED FLOORS
FENCING POSTS
TROUGHS
Concrete is like good wine—it improves with age.
Make full use of this adaptable building material round the farm and home for paths, floors, yards, tanks, troughs, fencing posts, etc. Concrete is more durable and more economical.
Look round your property and decide where you can use concrete to advantage. But remember—for best results use Wilsons Portland Cements—made in three types.
" Star " Brand for durability—" Wilsonite " Rapid Hardening for speed and " Repello," the water-proofed cement.
South British Insurance Buildings, Shortland St., Auckland.
5978
WILSONS
N.Z. PORTLAND
CEMENT
LTD.

Tuberculosis In Pigs

★ *Tuberculosis, very rare among wild and range animals, has become a menace to stock in proportion to the increase of intensive farming methods. Watchfulness, therefore, and careful management are the only means the farmer has of lessening the great waste from this disease.*

By
D. MARSHALL,
District Superintendent,
Wellington.

TUBERCULOSIS in pigs is not a spectacular disease. It is not often that symptoms are shown by the living animal sufficient to justify a diagnosis, and most information regarding the condition is obtained in the course of meat inspection. The strict requirements of the export trade necessitate a very searching examination of the carcass and organs, particularly the lymphatic glands. For the benefit of those to whom it is unfamiliar the following brief outline of the method of inspecting the carcass is given.

After scalding and cleaning the carcass is disembowelled and the glands of the intestines are searched. Then all accessible glands in the carcass and the chestwall are inspected, together with the lungs and the associated glands. In a large number of cases the infection is confined to one or other of the glands in the throat region.

In such case the head is removed and condemned. It then becomes necessary to split the carcass, when it is subjected to complete and more extensive re-inspection. Should no further evidence of tuberculosis be found, the carcass may be passed for export if otherwise suitable. A decision as to whether the whole carcass is condemned or not is based on the extent and degree of the infection, and the possibility of the meat itself being infected.

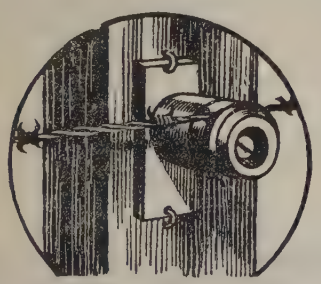
In an endeavour to reduce the disease reports are made of any lines in which the percentage is high, and these are referred to veterinarians and inspectors of stock in the area from which pigs came. The matter is then followed up on the farm, other stock examined and advice given. This will be referred to under control measures.

Sources of Infection

Sources of infection may be discussed under the following headings:—

(1.) Infection From Tuberculous Cows.—This may occur through the skim-milk where home separation is practised, or through grazing after infected cattle or rooting in infected droppings. It is probably the principal source of swine infection in New Zealand. Inquiry on the farm shows in many cases either a diseased cow in the herd or a history of one recently disposed of. Infection from buttermilk or whey is not impossible, but appears unlikely because of the pasteurising process to which the cream or milk is submitted during manufacture. Tests of whey suggest that amount of infection in this by-product is very small.

(2.) Infection Through Association With Diseased Poultry.—In the U.S.A. when the practical elimination of bovine tuberculosis from considerable areas was not followed by a corresponding reduction in swine tuberculosis, further investigation showed that most of this latter was due to the avian type of organism. Usually this tends to remain localised in the glands of the pig, but cases of generalisation calling for total condemnation may occur. Possibly a wrong impression may have been given to farmers in this country of the relative importance of avian tuberculosis in pigs in New Zealand as a result of the way it is stressed in U.S.A. publications and instructional films. Actually, the amount

"PREMIER"
The De Luxe Electric Fence Charger with Exclusive Rustproof Insulator Fence Plates.
The 100% effective Premier saves 80% of Fencing Costs . . . It is constructed to last a lifetime, and is unconditionally guaranteed for 12 months . . . The Premier is the ONLY Electric Fence Charger with which Rustproof insulator fence plates and screws are supplied (as illustrated) . . . a deciding factor of superiority in itself.
Price, complete with all accessories, including wet battery £12/5/-

Rustproof insulator fence plate and insulator. Minimises breakages, faulty insulation and loss of power. Exclusive to the Premier.
WIRE Prospective North Island purchasers of the Premier please NOTE. Up to 3cwt. of barbwire is still available at market prices.
Free Illustrated Folder and Details regarding actual field experiences carried out with the Premier Elctric Fence charger, will be posted on request . . . Write to—*N.Z. Sole Distributors :*
PREMIER PRODUCTS LTD. HUDDART PARKER BUILDINGS, WELLINGTON

here is believed to be small. Cases come to light from time to time where there appears to be a definite relationship between the amount of tuberculosis in the pigs and in the poultry. Symptoms of tuberculosis in poultry are often summed up under the expression of "going light." There is wasting of the breast muscles, pallor of wattles and comb, sometimes diarrhoea, occasionally lameness. On post-mortem examination whitish specks or nodules of varying size may be present in and on the liver and spleen.

(3.) Infection From Tuberculous Sows.—In the past one has believed this to be a minor cause so far as New Zealand was concerned. The writer can recall only one case, and in this instance externally visible signs of tuberculosis in the shape of swollen throat glands were present in several just weaned pigs, the mother of which was found diseased. In the course of the investigation previously mentioned several instances have occurred where there was strong evidence that the disease had been contracted from the sow, which was later totally condemned at the works or wasted and died. In certain cases the sows reacted to the tuberculin test. It would appear necessary, therefore, to be suspicious of any sow showing such symptoms as loss of condition out of proportion to feed or demands of litter, abnormal swellings without external injury in region of throat, jaw, or cheek, or chronic and gradually increasing enlargement of one or more sections of the udder.

(4.) Feeding on Raw or Imperfectly-Cooked Carcasses of Diseased Stock—It is an offence against the Meat Act to feed any uncooked meat to pigs. Careless neglect to bury dead carcasses may result in pigs gaining access to them. Where cull cows are bought for slaughter for pig food, there is always a possibility that tuberculous lesions are present. To guard against this, care should be taken that meat is cut into reasonably small pieces and that cooking is sufficiently thorough to sterilise any such overlooked lesion.

Control Measures

Elimination of tuberculosis from dairy herds by the use of the tuberculin test would be the most effective measure, but is at present impracticable. Pasteurisation of all skim-milk or other dairy by-products has been advocated, and suitable devices are on the market.

Prompt reporting to the nearest inspector of stock of any cow in the dairy herd showing suspicious symptoms, such as loss of condition and cough and noisy respiration, would eliminate many centres of infection. Farmers should avoid any contact between poultry and pigs, such as hens in the pig runs or pigs grazing where poultry run, and should report or slaughter any sows showing the symptoms already outlined. All meat or garbage used as pig food should be thoroughly cooked.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the five months, May-September, 1940, have been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat Export Slaughterhouses—						
Auckland	89,322	453,402	63,597	38,263	103,045	68,919
Poverty Bay - Hawkes Bay	41,539	45,736	115,656	50,451	127,289	8,093
Taranaki-Manawatu	53,012	171,339	65,569	40,672	138,490	41,745
Wairarapa-Wellington	25,741	22,550	53,036	28,304	89,885	8,642
Totals	209,614	693,027	297,858	157,690	458,709	127,399
Abattoirs	54,694	18,680	196,813	100,439	13,465	39,937
North Island Totals	264,308	711,707	494,671	258,129	472,174	167,336
South Island						
Meat Export Slaughterhouses—						
Nelson-Marlborough	1,232	6,867	26,552	12,276	51,359	2,758
Canterbury	5,798	25,070	221,851	180,655	321,950	9,566
Otago-Southland	6,209	21,739	157,234	131,835	587,766	2,708
Totals	13,239	53,676	405,637	324,766	961,075	15,032
Abattoirs	23,817	5,440	109,109	53,475	8,128	15,573
South Island Totals	37,056	59,116	514,746	378,241	969,203	30,605
Dominion						
Meat-expt. Slaughterhouses	222,853	746,703	703,495	482,456	1,419,784	142,431
Abattoirs	78,511	24,120	305,922	153,914	21,593	55,510
Grand Totals	301,364	770,823	1,009,417	636,370	1,441,377	197,941
Same Period, 1939— Meat Export Slaughterhouses and Abattoirs	242,311	775,674	751,772	397,257	1,499,073	150,431
Same Period, 1938— Meat Export Slaughterhouses and Abattoirs	222,468	759,576	866,521	507,761	1,331,487	209,147

Slaughterings of Pigs

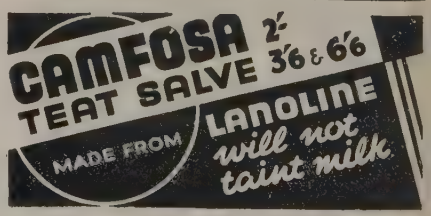
The 21,181 pigs killed during September were distributed in weight ranges as follows:—

Under 60 lb.	132
60-100 lb.	6,041
101-120 lb.	3,170
121-160 lb.	7,446
161-180 lb.	2,371
Over 180 lb.	1,146
Sundries	875

The grading of pork is 81 per cent. primes and 19 per cent. second quality; and of bacon, 78 per cent., 17 per cent., and 5 per cent. of of prime 1's, prime 2's, and second quality respectively.

In different weight ranges of baconers the grading is as follows:—

101-120 lb.	88% 8%, 4% of P1, P2 and seconds.
121-160 lb.	79%, 16%, 5% of P1, P2 and seconds.
161-180 lb.	65%, 27%, 8% of P1, P2 and seconds.



Growing Swede Crops For Winter Feed

Farming Methods in Rotorua District

By C. S. DALGLIESH,
Fields Instructor, Rotorua.

A good crop of swedes which yielded 57 tons per acre.

THE sowing of turnips and swedes will now be claiming the attention of farmers. Swedes are the standard winter crop, turnips being utilised for early and late autumn supplementary feeding. The yellow-fleshed varieties are not so widely used as formerly, and are being replaced by such white-fleshed varieties as Imperial Green Globe and Hardy Green Globe, which are firm in the flesh.

To secure a reasonable crop of turnips or swedes, the first factor is to have the land in good heart. Careful ploughing to ensure that all weed growth is completely buried, followed by thorough preparatory cultivation to secure a fine seed bed, is essential, but the prime factor in securing satisfactory crops is to have the land in good heart.

The time of ploughing and the general cultivation and manurial treatment required vary in accordance with climate and soil. The soils of the Rotorua-Putaruru-Tokoroa districts

Farmers will now be considering the sowing of turnips and swedes. Increased swede crops mean more winter feed. More winter feed means increased production in the following season.

are of the pumice nature; they are light, very free, and easily cultivated, and the average annual rainfall is more than 50 inches, which is fairly evenly distributed throughout the year.

Temporary Pasture

Swede crops grown on virgin land are light, and the most common farming practice when first ploughing this class of land is to sow in a temporary pasture in which a liberal seeding of red clover is included. Red clover grows luxuriantly, and plays an important part in building up the fertility of the soil. After two to three years, when the temporary pasture has to a great extent deteriorated, the land is ploughed and cultivated, and then sown in a swede crop. Excellent crops are obtained by this method.

On farms which have been farmed for a number of years, swedes are principally grown following the breaking up of old pastures. Although pumice soils are light and do not appear promising in the natural covering of light scrub, fern, and tussock in its virgin state, surprisingly good crops are produced, following a temporary pasture or the breaking up of old pastures.

Cultivation

Farmers' field competitions have given reliable information in regard to weight per acre, methods of cultivation, and manurial treatment. The highest weights recorded are 60 tons and 57 tons per acre, and crops ranging from 35 tons to 40 tons per acre are common. The ploughing of virgin land is usually done in the late autumn

Sow Sutton's Seeds
for sure results

or winter to allow soil aeration. Field competition records show that in the general production of swedes the time of ploughing—other than for virgin lands—ranges from August to October; September and October appears to be a popular period for this work.

Too often, cultivation consists of a double discing and once over with the chain harrows, but this is not sufficient to break up the furrow. The cultivation method followed year by year—and that which has given the most consistently successful results in even and good crops—is ploughing 5 to 6 inches deep in October, and rolling in the direction of the furrow at the end of each day's ploughing. This greatly assists in giving good consolidation and in pressing the furrows close together, and checks weed growth. The land is then double disced lightly in the direction of the ploughing and then on a slight angle, but never directly across the direction of the ploughing, as this tends to lift the furrow, and faulty germination will result. A double stroke with the tine harrows, or more if required, is also done in the direction of the ploughing or on a slight angle, and the land is rolled before the seed is sown.

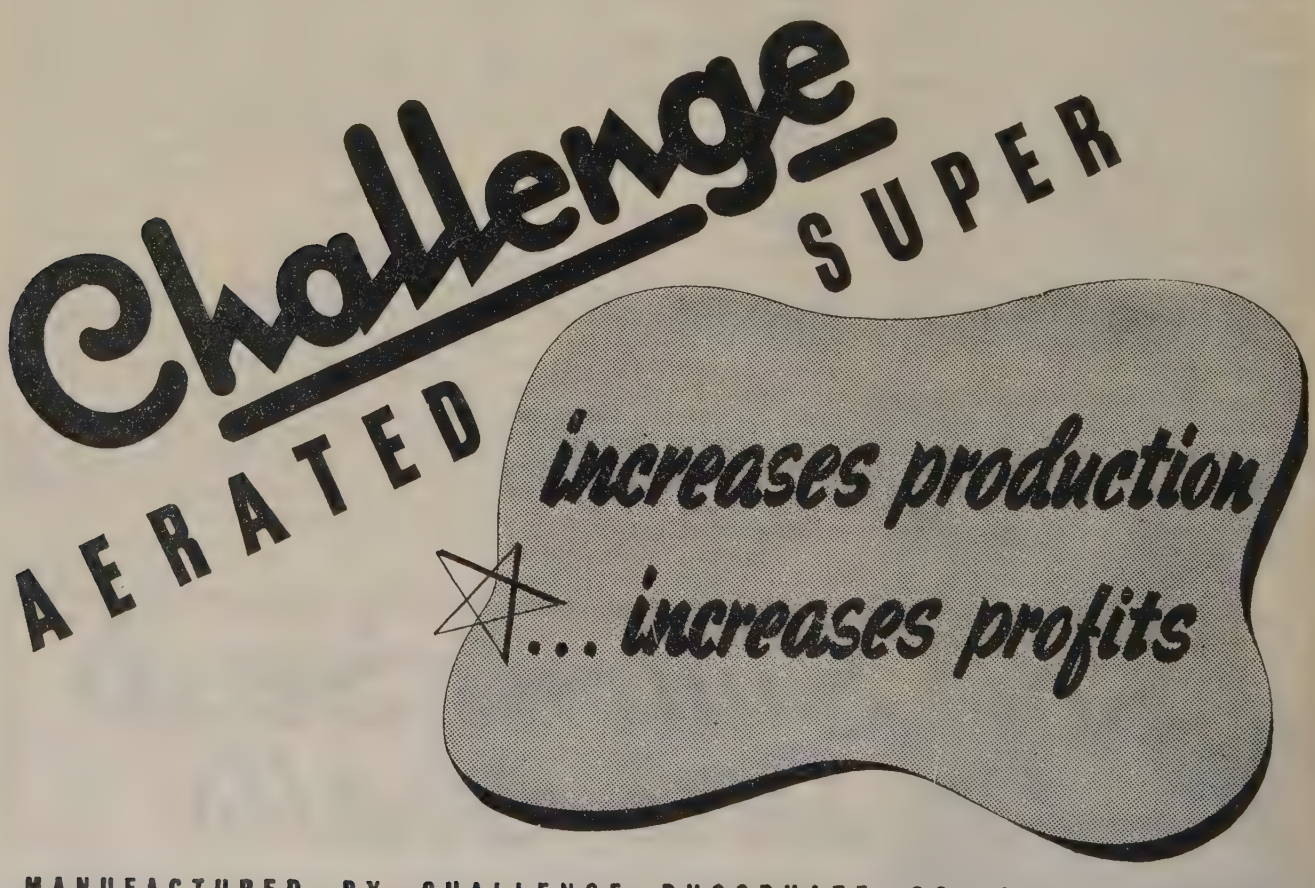
Manurial Treatment

Good crops have been produced with various fertilisers in which phosphates predominate applied at rate of 2½cwt to 3½cwt per acre. A popular fertiliser used throughout Putaruru and Tokoroa districts, and one which has produced winning crops in field competitions, is a mixture comprising:—Superphosphate 2cwt, Seychelles ½cwt, boneflour 40lb, basic slag 70lb, and sulphate of potash 30lb, applied at rate of 3cwt to 3½cwt per acre. The use of sulphate of potash from 20lb to 30lb per acre added to phosphatic mixtures finds much favour.

A common farming practice where land has been consistently topdressed for a number of years is to discontinue the topdressing one or two years before ploughing the land for the swede crop. Farmers consider that there is less likelihood of the crop producing much growth of tops and neck, which often occurs when they are grown on heavily-topdressed country.

Borax is being successfully used as a means of control of brown heart, and is applied at rate of 6 to 8lb per acre mixed with a quantity of fertiliser and applied to the land a few days before the seed is sown with 1cwt or more of fertiliser. This is a safe method to adopt, as mixing borax with the seed is liable to be detrimental to germination.

The usual rate of seeding is 12 to 14 ounces per acre, drilled in rows 14 inches apart. The main period of sowing is during the second and third weeks of December. Garton's and Sutton's Superlative varieties are most commonly sown.



Swedes in the Southern King Country

By W. T. BROWN,
Fields Instructor, Taumarunui.

SWEDE growing is practically the only cropping carried out in the Southern King Country, and it is unfortunate that this crop is gradually becoming harder to grow and more liable to attack by bacterial diseases.

Although the area sown in turnips and swedes is the largest of any crop in the Dominion, it has declined by nearly 110,000 acres over the last nine years. To some extent, this decline may be attributed to the large areas of land becoming fully developed, with the consequent change-over to all-grass farming. Another reason is that in the developed areas these roots are becoming a less certain crop, due to the invasion of bacterial diseases and insect pests.

In this district swedes played one of the leading roles in reclaiming the land from bush, and later proved a very payable crop in rejuvenating run-out grassland.

A good sample of Grand Master swedes.

Climate and Soils

The central counties of the North Island have a favourable climate. The average annual rainfall is about 60 inches, and is fairly well distributed throughout the year. To many, this may appear to make the feeding-off of the crop a difficult matter, but fortunately most of the soils have excellent drainage, and bad pugging of swede fields is rare.

As the soils are loose, friable and of fairly high fertility, good crops should result if the land is cultivated early, consolidated, and well manured.

A common mistake is too hurried cultivation. The ploughing is often left too late, with the result that cultivation is rushed and the soil is not sufficiently consolidated.

Fertilisers

The fertiliser usually used is superphosphate. This manure gives good results when the crop is sown by hand, but when a drill is used it is liable to cause quite a severe injury to the germination. When sowing through a drill it is advisable to use a half-and-half mixture of superphosphate and carbonate of lime or reverted or basic superphosphate.

The best results, however, are obtained when a mixture of 2-3 parts of superphosphate are mixed with 2-1 part of blood and bone manure and sown at the rate of 4cwt per acre. Lime, as mentioned above, should be added to drill-sown manure.

Rate of Sowing

When swedes are drilled 12 to 14 ounces of seed per acre should be sufficient, but when broadcast the seed is better sown at the rate of 1lb per acre.

For broadcasting, the seed may be mixed with the manure and both sown at the same time, but farmers should be careful not to mix more than one day's sowing at a time, as the manure will injure the seed if they are in contact for more than a few hours. It is good practice to mix the seed and manure and sow the same day.

Varieties

There are many varieties of swedes sown, and where swedes are the only crop regularly sown, farmers are inclined when a standard variety fails in a certain year to try new seed, the characteristics and qualities of which are entirely unknown.

The most common variety sown in this district is known as Superlative, and farmers sow under this name two different swedes—Suttons Superlative and Gartons Superlative. Fortunately, both these swedes do well under local conditions, and whichever variety is sown should give good results.

For the first crop it is advisable to use one of the Superlative swedes, as

Cheaper Fire Insurance!

DIVISION OF PROFITS TO FIRE POLICYHOLDERS

Applicable to all policies falling due during twelve months commencing 1st December, 1939.

STATE FIRE

INSURANCE OFFICE

Support your own Office

these are high producers, and although susceptible to bacterial diseases, such as club root and dry rot, usually produce excellent crops when the land is first ploughed from lea.

Because of the small area of ploughable land on most farms it is the usual practice to take two crops of swedes before returning a field to grass. This custom, which cannot be recommended in ordinary circumstances, must however be condoned for farming under King Country conditions, but where a second crop is taken the variety Wilhelmsburger Otofte should be used.

Wilhelmsburger Otofte is becoming more and more popular each year, and is proving itself a very disease-resistant and long-keeping swede.

Superlative swedes are usually sown about a week before Christmas, and when sown at this time give good results. When sowing the Wilhelmsburger Otofte variety, however, it is advisable to sow about a month earlier (the third or fourth week in November), as these swedes are slower in maturing.

Another variety which is showing good results as a first cropper is Grand Master. This swede produces good, sound crops, but is not extensively used, although it would appear to be a little more resistant to bacterial diseases than Superlatives and to produce equally heavy crops.

Vilmorin swedes are fairly extensively grown, but although claiming a degree of disease resistance, do not appear to have this very desirable quality in this district. This variety is very fangy, and the wastage incurred during feeding-off does not add to its value.

Conclusion

It is quite evident that although the Agricultural and Pastoral Statistics of New Zealand show that the Dominion's turnip crop has decreased from 440,214 acres in 1930-31 to 332,628 acres in 1938-39, turnips, and more particularly swedes, still hold their place in the farming calendar of the King Country.

By growing selected, disease-resistant varieties, second crops can be grown successfully, and there is ample scope for an increase in this crop. Increased swede crops mean more winter feed, and more winter feed means increased production in the following season.

BOMBS BUTTER
and MOTOR CARS

In this photograph of a New Zealand waterfront you see a vital part of the Empire's war effort. While 8 h.p. Anglia motor-cars from the English Ford factory were being unloaded, New Zealand butter was going aboard for England's use. England needs and must have our primary products. To help pay for these purchases, she is building motor cars for export only, with the expressed encouragement of the British Government. So when you buy an 8 h.p. Anglia you make a three-fold contribution—you help England and you help New Zealand's two largest industries, the primary products and motor industries.
You help yourself, too, when you became an 8 h.p. Anglia owner. It's the only 1940 model 8 h.p. car in New Zealand. It gives you the benefits of the newest developments in the light car field . . . plus the biggest body and the largest luggage compartment of any "Eight." Luxurious appointments too, and a sturdy British Engine that gives sparkling performance and exceptional economy. Choose the 1940 8 h.p. Anglia—England's Economy "Eight." See it now at your nearest Ford Dealer's.

1940 8 H.P.
ANGLIA
£294
ENGLISH Ford PRODUCT
FORD MOTOR COMPANY OF NEW ZEALAND LTD. LOWER HUTT WELLINGTON

Kikuyu Grass

Beware of this Grass on Fertile Land

A warning is sounded in this article on the use of kikuyu grass in the Auckland Province. The indiscriminate planting of kikuyu grass in the North constitutes a great danger, and there is little doubt that where this grass is getting on to highly fertile country it will prove a curse and will in a very short time have a disastrous effect on production in the affected areas.

— By —
P. S. SYME,
Instructor in Agriculture,
Warkworth.

KIKUYU grass (*Pennisetum clandestinum*), a native of Rhodesia, was introduced into New Zealand about 1919, and is now well known, if only by repute, throughout the warmer areas of the Auckland Province.

The grass is readily identified by its numerous thick, jointed runners ramifying in all directions and capable of forming a new root system at each joint. The foliage, too, is distinctive, being of a bright green colour during the active growing season, and of a sickly yellow throughout the dormant winter period. Although it produces seed in its native country, and was actually established in Australia from seed, the plant does not form seed in New Zealand, and propagates itself entirely by means of its vigorous spreading runners. It is indeed a twitch par excellence, with corresponding potentialities for mischief.

Typical Experience

Many farmers in the North have of recent years explored the possibility of utilising kikuyu as a pasture grass, and the experience of Mr. A. Sanderson, of Warkworth, is perhaps typical. Mr. Sanderson obtained a single plant about 10 years ago, and planted this in the vicinity of his cowshed. During the following year or two runners from the original plant were established on other portions of the farm. These young colonies flourished exceedingly, and Mr. Sanderson observed their progress with satisfied approval.

What of the position today? Alas! Mr. Sanderson is now by no means so satisfied. The kikuyu, a mediocre servant, has insidiously become a very bad master.

Alarming Spread

On the loose fertile soil adjoining the shed the kikuyu spread with alarming rapidity when once established, the process being expedited by joints from the runners becoming attached to the feet of the cows, and so transported and very efficiently transplanted to form fresh colonies over the farm. The fertile shed paddocks which formerly carried an excellent rye-clover sward now carry a practically pure sward of kikuyu. Where the cows formerly searched for an odd patch of the grass as providing variety, they now find variety in an odd patch of rye and clover.

Following the fertility built up by the clover, kikuyu grew vigorously in the early stages, and provided a fair amount of feed. The clover, however, was quickly suppressed, and, lacking a generous supply of the essential nitrogen, the kikuyu gradually formed a stemmy sod-bound mat of runners of inferior feeding value. As the stock did not relish this, Mr. Sanderson decided to utilise the growth for ensilage. This was quickly found to be quite impracticable, and, after repeated breakages of the mower in an endeavour to cut the matted growth,

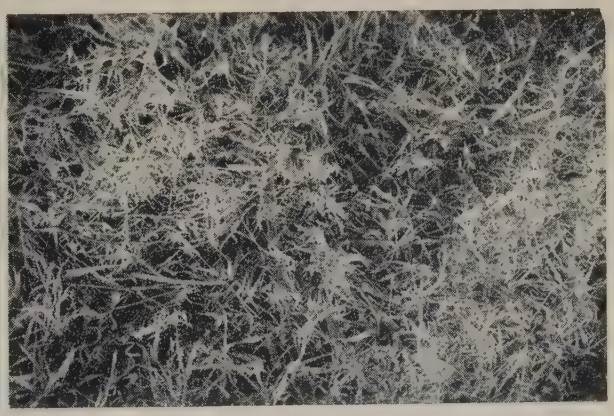
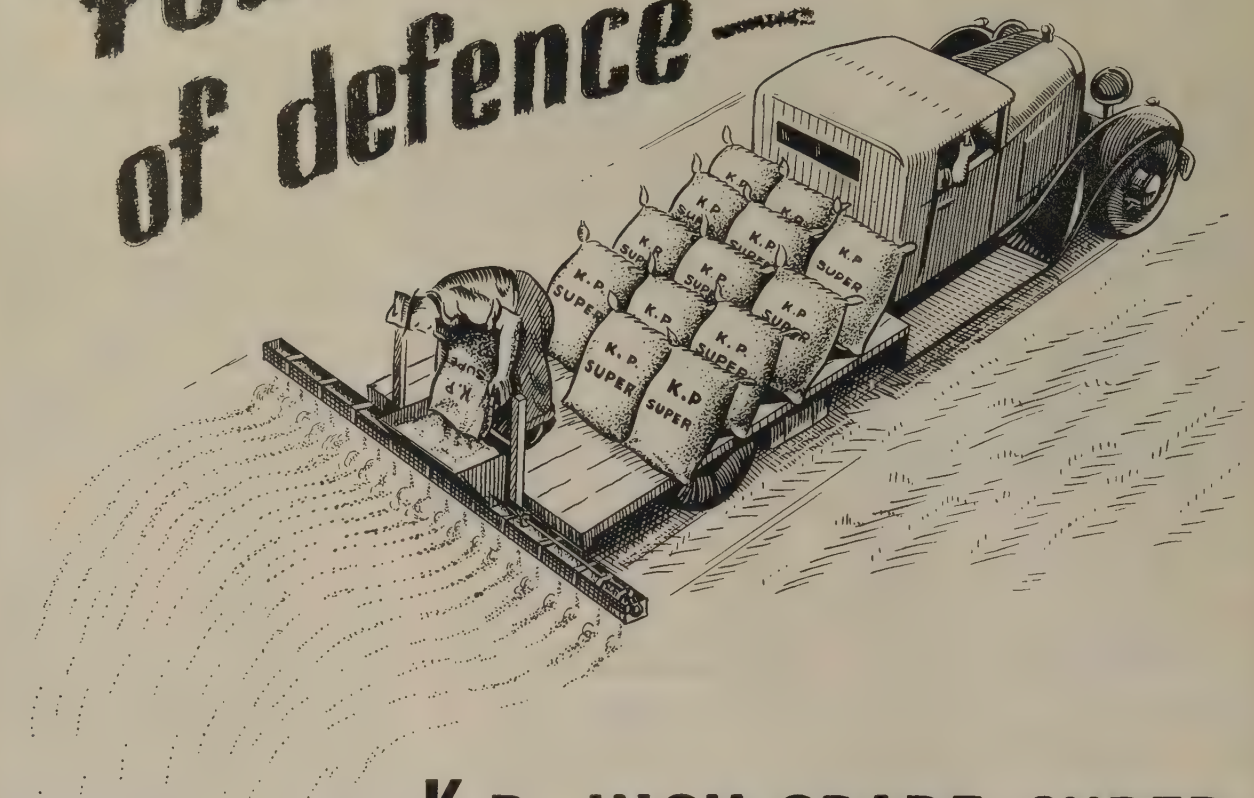
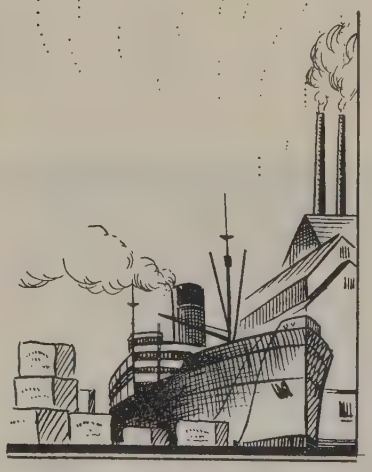


Fig. 1.—Kikuyu is a twitch par excellence. The runner here shown was nearly 7 feet in length. Each of the numerous joints is capable of producing a new plant. At certain stages the grass is unpalatable to stock, due to the small proportion of leafage to stem, as seen in photograph. *Fig 2.*—A typical kikuyu sward. The dense mat of runners quickly chokes out the clovers and forms a pure sward.

Your best line of defence —





K.P. HIGH-GRADE SUPER

AND OTHER FERTILIZERS

are the answer to our Empire's urgent call for maximum primary production to-day, and the basis of every well-planned topdressing programme.

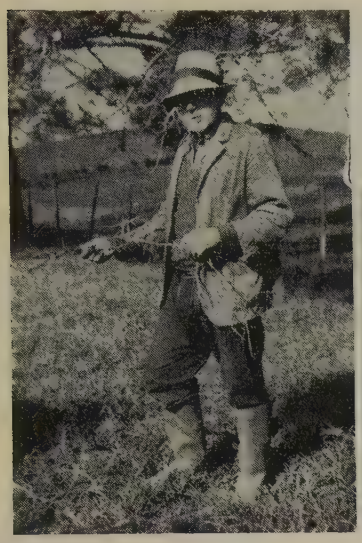
Every bag of K.P. Fertilizers brings you the double benefit of minimum outlay and progressively greater returns both in quality and quantity——

SO SEND IN YOUR ORDERS NOW TO

KEMPTHORNE PROSSER & CO'S N.Z. DRUG CO. LTD.

PIONEERS OF N.Z.'s FERTILIZER INDUSTRY.

AUCKLAND WANGANUI CHRISTCHURCH DUNEDIN



Figs. 3 and 4 (left and bottom).—Once a rich rye-clover pasture; now rapidly becoming a sod-bound and unpalatable mat of kikuyu. *Fig. 5 (right).*—Invading kikuyu treated with sodium chlorate. The underground stems render the weed difficult to kill, and to be effective repeated treatments are necessary.

Mr. Sanderson reductantly admitted defeat on this front.

On his lawn—which also had become a kikuyu mat—Mr. Sanderson essayed a flank attack. He treated this area with a very heavy dose of agricultural salt, but here again he suffered defeat. If anything, the weed appeared to grow even more vigorously than before.

On adjacent paddocks where the ground is harder and the fertility somewhat lower, the kikuyu has made much slower progress, although many patches of a square chain or more in area are now thickly infested. Progress here is slow but definite. On still harder un-topdressed paddocks the kikuyu has made little or no headway, and one patch covering a few square yards, and which was planted about

INCREASED PRODUCTION is of Paramount Importance

To-day, when every job on the farm must be carried out with the utmost speed and thoroughness, modern efficient implements are essential. Ensure the success of your root crop sowing and cultivation by using R. & G. Ridgers and Scufflers.

R. & G. RIDGERS & SCUFFLERS

R. & G. Improved RIDGER

This improved Ridger incorporates every conceivable improvement that 70 years' farm tests have shown and proved. It is full-sized, fully automatic, and fully equipped. Frame is of welded, toughened steel for maximum strength. Unbreakable steel wheels, with welded rims. Famous Star Manure Feed and Single Drop Turnip Seeder minimise waste.

R. & G. DISC SCUFFLER

This R. & G. Disc Scuffler is light and easy to operate, yet it is of exceptionally strong construction and will stand up to years and years of honest work. Discs can be set at any desired angle for close cutting. High guide rollers give ample clearance, and main axle will not interfere with plants on high drills. Made in 2 row for horse haulage and 3 and 4 rows for tractor haulage. The 2-row is ideal for operating after a 2- or 4-row ridger.

REID & GRAY LTD.,

HEAD OFFICE and WORKS - - - BURNSIDE, OTAGO

Branches at Invercargill, Gore and Balclutha.

AGENTS: Auck.: Alfred Buckland & Son., Ltd.; Ham.: A. M. Bisley & Co.; Gisb.: Williams & Kettle Ltd.; Pal. Nth.: Reid & Gray Agency Ltd.; New Ply.; J. B. MacEwan & Co. Ltd.; Masterton and Nelson: Levin & Co.; Blen.: R. Cresswell & Sons; Oamaru: Ernest Reid & Co.; Ch'ch., Ash., Tim., and Waimate: National Mortgage & Agency Co. Ltd.

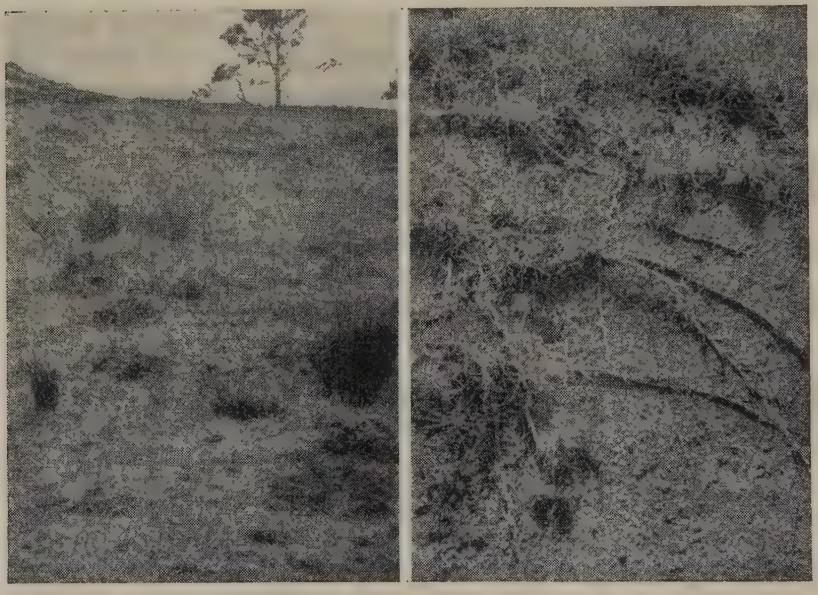
seven years ago, is still not appreciably larger.

Effect of Loose Soil

Judging from Mr. Sanderson's experience, kikuyu grows vigorously only on land where the fertility is high or the soil is soft and loose. On hard, tighly-packed ground it can make but little growth, and does not readily establish. Additional evidence of the importance of a loose, free soil is to be seen on the farm of Mr. R. Ellis, Kaipara Flats. On this farm kikuyu was planted a few years ago in an endeavour to grass over an extensive slip on a steep hill face. Here it has established well and is rapidly covering the loose exposed surface soil and assisting in the prevention of further erosion.

Similarly, the rapid establishment of kikuyu planted on the loose, built-up embankments of the Dome Valley highway by the Public Works Department suggests that an open or loosely-compacted soil is an important factor in the rapid colonisation by this grass.

Fig. 6.—Kikuyu makes very rapid progress on loose soil. The photograph shows an embankment near the Dome Valley on the Northern Highway, where kikuyu has been planted as a binder.



Figs. 7 and 8.—Kikuyu grassing over a slip on the farm of Mr. R. Ellis, Kaipara Flats.

While kikuyu may have a definite value for covering slips and checking erosion on hill country, the possibility of its being transported by stock to adjacent soft and fertile land must not be overlooked. On such country it can only be regarded as a dangerous weed, and one which, once properly established, will in practice never be completely eradicated.

In this connection the experience of Mr. F. J. Foote, Mangawai, is worthy of mention. A few years ago Mr. Foote planted a few runners of kikuyu on a rich, sandy flat. Regret quickly followed, and Mr. Foote is now making strenuous and costly efforts to suppress and eradicate the weed by treating the now numerous established colonies with sodium chlorate.

In view of the fact that kikuyu tends to form a pure association and to suppress and choke out clovers, its production is eventually limited by the nitrogen naturally available, so that there is every likelihood of the sward degenerating into a poor, unpalatable, matted, and sod-bound mass of stems and runners. On good, rich soil it succeeds too well; on poor, stiff clay it is practically valueless. It is

YOU CAN BE SURE OF SHELL

useless for hay, and, being very susceptible to frost, is dormant throughout the winter—two serious defects, which, combined, might provide rather a problem in connection with the winter feed supply should kikuyu encroach on the good pasture land.

Australia Experience in

That experience in Australia is somewhat akin to that in New Zealand may be gathered from the following extracts from a letter from Mr. M. Cullity, Senior Agricultural Adviser for Western Australia:—

"Kikuyu grass is not sown here on a large scale; and its use is restricted to sites where it will not prove a menace to cultivated areas.

"Sufficient knowledge is not yet available to enable me to state that the grass can be kept in a vigorously growing condition. The evidence is rather in the other direction, inasmuch as the grass tends to become sodbound and particularly difficult to renovate.

"The use of the grass is not recommended on rich, flat country, as it has been demonstrated that better results can be obtained with other species. In the irrigation areas, where our best pastures are located, farmers are definitely advised not to use it.

". . . While we believe kikuyu has a use in certain of our areas, we do not rate it highly enough to spread it on to our more fertile areas."

Restricted Use

While little danger is to be expected from kikuyu running amok on the poorer gumland soils, this itself merely indicates its very low value under these conditions. Moreover, it may not stay there, and the experience of two of the farmers mentioned suggests a very real danger should even a few runner joints be transported on to good land. As a soil-binder on poor eroded country it may be of some value; and for a sports ground in far off South Africa it may indeed be excellent. Its indiscriminate use near rich, soft land where it is not curbed by winter frosts, however, may well be very unwise. The early establishment in a pasture is somewhat insidious, and in this connection the name "*clandestinum*" may not be without some significance.

Prevention is better than cure, and it is certain that if kikuyu once becomes firmly established on rich, soft land it may prove impossible economically ever to eradicate it.

Kikuyu Grass Has a Place in Holding Sand Dunes

By
J. E. BELL,
Instructor in Agriculture, Auckland.

Although kikuyu grass, because of its spreading tendencies, is dangerous on agricultural land, it is worth consideration as an aid to holding sand dunes. Farmers should read the preceding article, however, before planting this grass.

FOR some years I have interested myself in the establishment of kikuyu grass on land which is not agricultural. Around the coasts of New Zealand there are many thousands of acres of sandy wastes, where there was once grave danger of the sands drifting and covering good agricultural land. This danger has been dissipated by the establishment of marram grass in the moving sand, beginning first at the foreshore dunes and working inland. After marram grass has prevented all blowing, yellow lupins generally establish themselves or can be introduced. While the lupin is present the sand which is shaded by its cover keeps moist at the surface over the summer, but after the lupin goes the sand becomes very dry at the surface and will support only those grasses which resist arid conditions.

While the lupin cover is present prairie grass grows quite well, producing a fair amount of fodder. The lupins, however, grow vigorously, and the carrying capacity of the shaded pasture plants beneath is low. When the lupins go the production is still low or lower because of the dry conditions which then prevail. The prairie grass which grew well under the lupin cover dies out very quickly, and its place may be taken by *Poa pratensis*, which, however, under the dry conditions, produces very little.

Here, I believe, is a place for kikuyu grass, with its wonderful drought-resisting properties. Grown in the loose sand, it is not nearly so liable to become sod-bound (at least patches established on sand for more than 10 years have not become sod-bound). It is most easily established just under the lupin cover or in the cattle tracks through the lupins. By the time the lupins die the kikuyu grass has become established, and in spite of the dry conditions it increases the area covered by it and produces a fair modicum of feed. Topdressed and stocked, odd white clover plants have appeared where, without kikuyu grass, it would be impossible for white clover to exist.

The illustration shows a corner of this sand country (on the farm of A. R. Hull, Taurangaruru) in marram and lupin. The marram grass in the photograph appears a very light colour, contrasting with the dark bushes of lupins. To the right on both sides of the fence is a small patch of kikuyu grass showing in the photograph a slightly darker appearance than the marram grass. Kikuyu grass establishes best in sheltered areas. On hillsides facing the sea breezes it spreads very slowly.

Book Review

"Agriculture"

— By —

R. P. Connell and J. W. Hadfield

EXTENSIVE and important alterations have been made in the preparation of the fifth edition of "Agriculture," by R. P. Connell and J. W. Hadfield. That these changes are authoritative is assured by the fact that the joint authors again have been able to enlist the services of the following fellow-workers, who are recognised as leaders in the sphere of agricultural research in which they specialise:—Dr. H. H. Allan, Director of Botany Division, Dr. G. H. Cunningham, Director of Plant Disease Division, and Mr. J. Muggeridge, Government Entomologist, all of the Department of Scientific and Industrial Research; Mr. A. W. Hudson, Lecturer on Soils, Massey Agricultural College; Mr. N. Foy, Director of Seed Testing Station, Department of Agriculture, Mr. R. W. Doak, Plant Chemist, and Mr. E. Bruce Levy, Director, Grasslands Division; while Dr. L. Grange, Director of the Soil Survey Division, Department of Scientific and Industrial Research, has, for the first time, assisted in the revision.

The chapter on seeds and seed testing now incorporates data that have become available since the preparation of the previous edition. The supply of soil moisture is of great moment in farming generally; hence, it is important to note that the section devoted to soil moisture has been wholly rewritten. Many amendments, mainly of a minor nature, have been made in the section dealing with artificial fertilisers, while the sections dealing with other factors affecting fertility, such as liming and drainage, have been freely revised in order to reflect the findings of recent investigations.

Some alterations have been made in the sections dealing with grass farming, but in general these changes are not of a major importance. The chapters devoted to farm crops have been subjected to a number of substantial changes and to many of less importance, the cumulative effect of the changes being an extensive revision bringing the subject-matter up to date. The sections dealing with diseases and pests have been similarly treated.

HESKETT SLAG

Many soils of high-rainfall parts of New Zealand lack Lime, and contain large quantities of Iron and Allumina, which rob the farmer of about four-fifths of every ton of Water-Soluble Phosphates spread on these soils; a Basic Slag contains, among other minerals, large quantities of a non-acid chemical compound known as Calcium-Silico-Phosphate which, it is claimed, has the power of unlocking these dormant minerals from the soil. The phosphates of a Basic Slag cannot be locked up by these soils because they are already combined in a form easily digested by the root acids as they need them.

Made in New Zealand for New Zealand Soils.

Finely ground and packed 18 bags to the ton, it is delivered f.o.r. Huntly, Waikato. Obtainable from Merchants and Dairy Companies or from the Chief Distributors—

Arthur Yates & Co., Ltd.

Whangarei : AUCKLAND : New Plymouth

Hayes' Rabbit Smokers

From WAIMAHAKA ESTATE, Invercargill.

Dear Sirs,—We have been using your Rabbit Exterminator for the last four months and have found it very effective to cope with the pest. It is economical to use and convenient to handle when working in gullies. Wishing you every success with it.—(Signed) A. S. HOLMS and SON.

Price with Standard Fire Box, £8/7/6

With Special Fire Box, £8/17/6

Manufactured by

E. HAYES & SON,

OTUREHUA, OTAGO. Phone 4D.

Certification of Perennial Ryegrass Seed

By
J. H. CLARIDGE,
Seed Certification Officer,
Wellington.

Left.—Harvesting a small area of a selected strain of perennial ryegrass seed. Note the spaced plants. Seedlings are transplanted and intercultivated to establish areas such as this.

Below.—Threshing the produce of a small area such as that shown above.

[*W. Gorman, photos.*

BEGINNING with the 1940/41 season, the Departure of Agriculture is introducing a new classification in connection with the certification of perennial ryegrass seed. Under the basis of classification employed in the past, five classes of this seed have been recognised. Under the revised basis certified seed will be placed into one or other of the four following classes —Government Stock, Pedigree, Mother, and Permanent Pasture.

The advantages of the revised method of classification may be summarised as follows:—

(1) Development of the Use of the Selected Strain of Perennial Ryegrass.—The strain of perennial ryegrass raised by the Grasslands Division of the Plant Research Bureau has so proved itself that the Department of Agriculture has now no hesitation in making it the basis of all perennial ryegrass certification. The new classification will enable farmers, whether they purchase Government Stock, Pedigree, or Mother seed, to be assured of the fact that they are obtaining seed of this strain. In the past such assurance has applied only to seed certified in the two former classes.

An excellent crop of certified pedigree perennial ryegrass seed.

[*W. Gorman, photo.*

(2) Simplification of Scheme.—The reduction in the number of classes from five to four without sacrifice of efficiency should prove welcome to the seed trade and to the farming community.

(3) Ease of Operation.—The new classification will ease to some considerable extent the attention required alike by merchants, farmers, and Departmental officials in the certification

of perennial ryegrass seed. This easing is due to the greater use to be made of the ultra violet light test in determining ryegrass strain, a test which over a number of years has shown itself to be particularly applicable to New Zealand-grown ryegrass seed.

The following diagram and notes illustrate the conditions required for qualification of seed in the respective classes.

1.

SEED OF SELECTED STRAINS
supplied by Grasslands Division of Plant Research Bureau.

Sown out under contract

2. Produces

GOVERNMENT STOCK SEED
(Distributed by Department of Agriculture through mercantile channels).

Sown out by farmers.

3. Produces

PEDIGREE SEED
(Distributed through usual trade channels.)

Sown out by farmers

4. Produces

MOTHER SEED
(Distributed through usual trade channels.)

Areas sown out with Mother seed or any other perennial ryegrass seed may produce seed acceptable for certification as

5.

PERMANENT PASTURE SEED
(Distributed through usual trade channels.)

(1) This stage represents the initial selection and testing work undertaken with all pedigree strains until such time as sufficient seed is available to sow an area capable of being handled as a commercial unit.

(2) Government stock seed is produced under contract to the Department of Agriculture in selected areas, and represents the highest standard of seed available to the farmer. This class of seed should be used only by those farmers who are prepared to treat seed production as of primary importance even to the extent of sacrificing as grazing propositions the areas sown.

(3) Pedigree seed, the product of areas sown with the above, is subject to a field inspection of the producing area and also to type tests of the seed produced. This seed is intended for use by those farmers who, while aiming at seed production, are not prepared to sacrifice their pastures to this end.

(4) Mother seed, produced from areas sown with Pedigree seed, is subject to similar tests before certification is granted. It is wholly of the pedigree or selected strain, and is intended for use by those farmers who may take a seed crop under favourable conditions, or who definitely require seed of this strain for ordinary pasture purposes.

(5) Permanent Pasture Seed.—Eligibility for certification in this class is based on the reaction shown when seedlings are examined under ultra violet light. The identification and field inspection of the producing area become unnecessary, an official sample of the machine-dressed seed being drawn for examination. Seed certified in this class is definitely of a permanent strain. It includes all that seed of the natural strains originating from Hawke's Bay and Poverty Bay which in the past ten years has been the foundation of perennial ryegrass certification. There will also be included seed of selected strain which is harvested from areas sown with Mother seed (see 4 above). No further comment should be necessary to emphasise the high standard of the seed to be accepted even in this the lowest grade of certified seed.

Growing Artichokes for Pig Feed

"PIG FEED" (OTOROHANGA):—

Would it be possible to print in a future "Journal" an article on the growing of artichokes for pig feeding in South Waikato—how much seed per acre, date of sowing, distance of rows, and distance apart in rows, how much manure, etc.

There are a good many farmers likely to try them if they are not too much trouble as a second crop to swedes.

FIELDS DIVISION:—

Artichokes do best on loams of light to medium texture; on the heavier and wetter types of soil the tubers do not keep well. The land should be ploughed in the late winter and worked up for planting in the spring. The easiest way to plant the tubers is to cross-plough and plant the tubers in the furrows like potatoes. The tubers should be planted three inches deep in rows 2 to 2½ feet apart and 18 to 20 inches apart in the rows. The crop should be fertilised with 3 to 4cwt. of super per acre.

Towards the end of September would probably be the best time for planting in your district. Where the tubers planted are small, it is best to plant two or three together, but one large tuber gives the best returns. The weight of tubers necessary to plant an acre is from 12 to 15cwt. Tubers which have been lifted and stored for any time do not "strike" as well as those lifted just before planting.

DELAYS *are* DANGEROUS
EFFECT That POLICY
with the
GOVERNMENT LIFE
TO-DAY

The Superintendent of the Pig Industry Discusses

Copra As A Pig Feed

Copra could be profitably used in New Zealand as a winter feed to replace grain, but for the time being its use for finishing baconers is not recommended. Until the results of current trials are known it would be safer to use copra for growing pigs and discontinue its use for the last six weeks before slaughter.

THERE is a prospect of copra being available as a pig feed, and inquiries are being received about its suitability. It has been under trial at Ruakura during the past two seasons, and results from there will be published as soon as they are available. In the meantime, it might be of some assistance to supply the general information that is already available.

Production And Use

Copra is produced mostly on islands, or near the sea, but seldom on mainlands. The output now is about one million tons yearly, and has increased by more than one-quarter since 1930 and by two and a half times since 1914. It is used for the production of coconut oil, which in turn is used for the making of margarine and soap. The value of copra varies with the supply and consequent price of competitive animal and vegetable oils, and went as low as £8 15s in 1930 and as high as £22 12s 6d in 1937, c.i.f., London.

Composition

Copra is the meat of the coconut and is supplied in pieces the shape and size of a heavy teacup or chips therefrom. It is subjected only to the process of drying either in the sun or in a kiln. The kiln-dried article naturally keeps better than the sun-dried, but it is reasonable to suppose that both kinds can be kept for long periods—up to a year or more. On being wetted, the particles swell up to the original thickness of the coconut meat.

Dried copra contains 63 to 70 per cent. of oil, 5 to 7 per cent. of protein, 15 to 20 per cent. of ash, fibre, and carbohydrate, and 6 to 10 per cent. of moisture. After the oil is expressed the resulting copra cake or meal contains approximately 6 to 10 per cent. of oil, 19 to 20 per cent. of protein, 60 per cent. of ash, fibre, and carbohydrate, and 10 to 12 per cent. of water. On these figures copra has a feeding value approximately twice as good as barley; copra-meal has about the same value as barley.

Use as a Pig Feed

Reports from Guam, California, Oregon, Ohio, and the Philippine Islands indicate that copra can be fed satisfactorily to all classes of pigs, weaners, stores, fattening pigs, suckling sows, etc. It can be fed as it comes out of the bag without any further treatment. The high oil-content limits the daily consumption to about one-third of the ration, that is, 1lb to 1½lb for big store pigs and to about 4lb for suckling sows. Amounts in excess of this tend to put the pigs off their feed. Bacon curers dislike pigs produced on a diet high in oil, and set the limit at 3 to 6 per cent. of oil. This is equivalent to not more than 5oz of oil for an average baconer daily, an amount containied in aproximately ½lb of copra.

Coconut oil is, however, remarkable for its non-drying properties. It is a saturated oil, and should not therefore give rise to the rancidity usually associated with the drying oils which so often constitute a large percentage of the oil in most feeds of animal or vegetable origin. Further, it has a fairly high melting point, and gives rise to a hard fat in pigs, comparable to that produced by a starch diet, and in contrast with the soft fat produced by other oils.

A Word of Caution

Copra could be profitably used in New Zealand as a winter feed to replace grain. It could be fed at the rate of ½lb to 1lb daily along with ½lb of meat-meal and roots or grass to store pigs. For the time being, its use for finishing baconers is not recommended. Reports on individual pigs fed on copra indicate that the carcass is free from taint, but the general information states that it has a bad effect on bacon. Until such time as this aspect of copra feeding can be definitely cleared up, it would be safer to use copra for growing pigs and discontinue its use for the last six weeks before slaughter.

Information Wanted

An inquiry has been received on how to construct a farm lorry from a Ford T chassis. No details of this nature are available, and the Editor would be glad to hear from any reader who can supply such information.

The inquiry is as follows:—

"Would you please furnish through your valuable 'Journal' a sketch of a design for constructing a farm lorry from a Ford T chassis? Would it be possible to embody the original stub axle steering, and could it be so constructed that shafts for horse or drawbar for tractor could be interchanged? I have in mind a four-wheel trailer. Thanking you—

'Ager.'"

HEALTHY LIVE-STOCK
and
HEALTHY LAND
are essential to
MAXIMUM PRODUCTION

Produce: **MORE BUTTER FAT,**
MORE MEAT, MORE EGGS,
MORE AND BETTER STOCK

By FEEDING "ECLIPSE" Brand
MEAT MEALS

To PIGS, DAIRY CATTLE, CALVES, SHEEP and POULTRY

The Feeding Value of a Meal is gauged, NOT by the cost per bag, but by its PROTEIN CONTENT.

In the drive for increased production consider the merits of "Eclipse" Meat Meals. They are the highest grade Meat Meals manufactured. Guaranteed to contain not less than 70% and 80% Protein, they are absolutely pure Meat Meals, finely ground and easily assimilable.

The Minimum Protein Content is Branded on all Bags.

"ECLIPSE" FERTILIZERS keep the land healthy and productive. They contain Blood and Bone and other value ingredients such as guano.

"Eclipse" Meat Meals and Fertilizers are procurable from all Stock and Station Agents, Merchants, and Dairy Companies, or direct from the manufacturers:

The New Zealand Refrigerating
Company Limited

Head Office: 159 HEREFORD STREET, CHRISTCHURCH

Works: Islington, Smithfield, Burnside, Picton, and Imlay.

Write to us for particulars and free booklet on the feeding of meat meal to all classes of live-stock.

Controlling Club-root Of Swedes and Turnips

By
J. W. WOODCOCK,
Fields Superintendent,
Dunedin.

Encouraging Results from Use of Mercuric Chloride

Following work in England and America, encouraging results have attended the use of mercuric chloride as a means of controlling club-root of swedes and turnips. Applications of as little as 2 lb. per acre in a special mixture with superphosphate and slaked lime have given greatly improved yields on crops heavily infected with disease. A large programme of experimental work is planned for the coming season, and if the results at present to hand are confirmed a reasonably practical and economic means of controlling club-root should be available to farmers.

FARMERS who are dependent on roots for winter feeding have a long list of foes which can spoil their best efforts, and one of the worst is the troublesome disease of swedes and turnips known as club-root. Club-root considerably reduces the yield, and sometimes it almost cleans out the whole area, leaving but a few hideous and distorted roots to mock the exasperated grower. It is true that some methods of control have long been known, but these are only partially effective.

One of the best safeguards against club-root is the growing of swedes or turnips on new ground. It is not always possible, however, to adopt this practice, and on pastoral areas farmers, having ploughed out good pasture for roots, naturally like to take off more than one cruciferous crop before sowing back to grass.

Resistant Strains

There are varieties of swedes such as Wilhelmsburger, Benefactor, and Herning, and varieties of turnips such as Bruce, Wallace, and 101 (Wonowon) which are fairly resistant to club-root. While the turnip varieties mentioned have met with much success in Southland, the resistant varieties of swedes are not popular with many farmers for various reasons, chiefly alleged lack of palatability, low cropping power on clean ground, and unreliability under severe club-root attack. As with all susceptible varieties of crops, however, failures do sometimes occur, but the chances of loss by this disease are reduced when resistant strains are used.

Heavy liming, especially with burnt lime, just before sowing tends to prevent the occurrence of the disease by reducing soil acidity, this latter factor being important in connection with club-root.

Gibbs (1), who carried out much work on club-root, considered that an application of about 30cwt. of burnt lime applied at least three months before seeding would control the disease provided that a non-acid fertiliser was applied at the time of sowing the seed. Although heavy liming is effective in many districts, there are localities, for example, Southland, where it sometimes fails to prevent the occurrence of club-root.

Use of Mercuric Chloride

In recent years attention has been paid overseas to the use of mercuric chloride in controlling club-root, especially in market garden practice. Gibbs (2) outlined a method by which the disease could be controlled in cabbage seed beds by the application of this material on the soil. This worker, however, made repeated attempts to utilise mercuric chloride on a wider scale, and experimented with various methods of incorporating the material with fertiliser. As the results of two years' field experimental work have shown distinct promise for such a mixture, it has been decided to make known the results and also to embark on a large series of field trials on swedes and turnips during the coming season.

Results of 1938-39 Trial

One experiment using two different mercuric chloride preparations was laid down at the Winton Demonstration Farm on December 12, 1938. A proprietary material known as "Brassican" was included as well as ordinary fertilisers not containing the above materials. Two varieties of turnips, Wonowon and Wallace, were sown, with five replications of the fertiliser treatments. Club-root did not occur to any great extent, probably because both the varieties used are resistant to it. Some valuable information was secured, however, on the effect of the following fertilisers on germination and yield.

(1) Gibbs, J. G., "Control of Club-root," N.Z Journal of Agriculture, January, 1932.

Trial A.

Treatments Per Acre.

(1) Superphosphate 3cwt. + carbonate of lime 3cwt.

(2) Above mixture containing 0.3 per cent. mercuric chloride powder.

(3) No. 1 mixture containing 2 per cent. "Brassican."

(4) Basic slag 3cwt.

(5) Superphosphate 3cwt. + hydrated lime 1½cwt.

(6) No. 5 mixture containing 0.3 per cent. mercuric chloride.

Treatment No. 6 was prepared in a special manner so that the solution was utilised in slaking the lime, and details of the method will be given later.

During the growing period it was observed that Treatments 4 and 5 had resulted in a very poor germination, whereas Treatment 6 showed a very good strike. Treatment 6 continued to show its superiority throughout the growing period, but the early setback on Treatments 4 and 5 lasted until harvest.

Yields in tons per acre (Mean of two varieties.

Treatment	Tons	No. of roots per chain
1. Super/carb. lime ..	15.9	47.5
2. As for 1 + mercuric chloride	18.3	44.9
3. As for 1 + "Brassican"	14.6	56.1
4. Basic slag	3.6	8.6
5. Super/dydrated lime ..	5.9	14.5
6. As for 5 + mercuric chloride	22.1	114.2

Treatments 4 and 5, largely by reason of lowered germination, were significantly lower in yield than the remainder, while Treatment 6 was significantly greater in yield than all but No. 2. The superiority of Treatment 6 would be largely attributed to the greater number of surviving roots.

In comparing results from Treatments 5 and 6, the only difference between which is the addition of 2lb. per acre of mercuric chloride in the latter, the results are very remarkable.

(2) Gibbs, J. G., "Control of Club-root in Cabbage Seed-beds," N.Z. Journal of Agriculture, May, 1935.

Neither basic slag nor super plus hydrated lime have previously been considered to be detrimental to germination, and, as will be seen later, subsequent experiments have not substantiated the above results as far as severe germination injury is concerned.

Results of 1939-40 Trials

Three experiments were conducted in the 1939-40 season at Winton, Gore, and Marton. The treatments were the following:—

(1) Super 3cwt. + carbonate of lime 3cwt. per acre.

(2) Above mixture containing 0.3 per cent. mercuric chloride powder.

(3) Basic slag 3cwt. per acre.

(4) Super 3cwt. + hydrated lime 1½cwt. per acre.

(5) No. 4 mixture containing 0.3 per cent. mercuric chloride.

Trial B.

Trial B was carried out at the Winton Experimental Farm, where Grandmaster swedes were sown on November 24, 1939, with the above fertilisers, the plots of which were replicated six times. Germination counts were taken on December 18, and yields, together with club-root counts, were taken on April 22, 1940. During the growing period Treatments 2 and 5 (those containing mercuric chloride) were outstanding as regards top growth. All the swedes contracted club-root, but mercuric chloride appeared to reduce the severity of the disease.

Yields, Germination and Disease Counts of Trial B.

Treatment	Germination No. of plants per 28ft. of row	Percentage severe club-root infection	Yield—tons per acre
1. Super/carb. lime	134.5	98.9	10.6
2. As for 1 + mercuric chloride ..	147.3	87.4	24.6
3. Basic slag	122.8	97.8	15.3
4. Super/hydrated lime	136.0	98.5	12.9
5. As for 4 + mercuric chloride ..	155.0	85.5	27.8

The addition of mercuric chloride to the superphosphate-lime mixture has resulted in significantly higher field germination and yields, and also significantly lower percentages of bulbs severely infected with club-root at harvest.

Trial C.

Trial C was laid down on the property of Mr. J. W. Kingdon, Gore. Knockdon swedes were sown with three replications of the fertilisers on November 28, 1939. Germination counts were taken on January 11, 1940, while estimations of yield were carried out on March 14 and June 10.

In the early stages Treatment 2 appeared to suffer in vigour compared with the other treatments and showed lower germination. When the preliminary yields were taken Treatments 2 and 5 were outstanding as regards top growth, reflecting a remarkable recovery by Treatment 2. There was 100 per cent. severe club-root throughout the trial, but the bulbs in the plots containing mercuric chloride showed greater resistance and developed well in spite of attack.

Germination and Yields of Trial C.

Treatment	Germination No. of plants per 10ft. of row	Yields in tons per acre	
		Preliminary 14/3/40	Final 10/6/40
1. Super/carb. lime	56.6	12.9	12.9
2. As for 1 + mercuric chloride ..	38.6	17.8	24.4
3. Basic slag	50.6	11.5	12.8
4. Super/hydrated lime	50.8	12.6	12.3
5. As for 4 + mercuric chloride ..	51.6	18.1	22.3
6. Reverted super 4½ cwt.	51.3	11.5	12.4

The use of mercuric chloride resulted in very marked and significant yield increases. There was also a tendency for a greater number of bulbs to survive on Treatments 2 and 5, although the bulb counts gave no significant differences. Treatment 2 had a significant depressing effect on germination, although apparently the stand was thick enough to give a good, even distribution of bulbs after singling. **Although no complete control of club-root was obtained, bulbs on the mercuric chloride plots developed well in spite of attack.**

Trial D.

Trial D was conducted at the Marton Experimental Area in 1939-40, but no significant differences were obtained either in the amount of club-root infection or yield. Club-root attack was very slight in this trial, and yields were high, all treatments yielding more than 40 tons per acre.

Summary of Experiments

In all experiments the superior vigour of mercuric chloride treatments as regards top growth was reported. In badly infected areas the mercuric chloride treatment did not eliminate club-root, but it conferred considerable powers of resistance, so that the bulbs have been able to develop successfully in spite of attack.

Both for final yields and safety in respect of germination injury the super-mercuric chloride-slaked lime mixture has proved superior to the super-carbonate of lime-mercuric chloride powder mixture in nearly every instance. The former, therefore, has been chosen to figure in demonstrations on farms during the coming season, and to simplify any reference to the mixture it will be hereafter termed "mercurated phosphate."

Preparation of Mercurated Phosphate

Through the courtesy of Messrs. Kempthorne, Prosser, and Co., Ltd., about a ton of mercurated phosphate has been manufactured for demonstration according to the following specifications:—

For each ton of fertiliser to be manufactured 9lb. of mercuric chloride are required. This is dissolved in saturated salt solution, and the liquid is then diluted to make a 4.8 per cent. solution of mercuric chloride weighing 187.6lb. This is added to 562.8lb. of ground burnt agricultural lime, mixed rapidly and left to slake. The resultant treated slaked lime, weighing approximately 6.7cwt., is mixed thoroughly with 13.3cwt. of superphosphate to make up one ton of mercurated phosphate.

Because of the scarcity of mercuric chloride at the present time the cost of this material is much greater than normally, being in the vicinity of 13s. per lb. This raises the price of the fertiliser to about £11 per ton, but even at this figure it is considered that in the light of results secured the use of the material is well worth while where club-root is prevalent. Under normal conditions, and where a greater use of mercuric chloride is likely, the cost of mercuric chloride would be reduced appreciably, bringing about a corresponding reduction in the price of mercurated phosphate.

Apart from the work carried out by Dr. Gibbs, field experiments were conducted by Mr. A. Stuart, Instructor in Agriculture, Invercargill, Mr. W. Faithful, Fields Instructor, Gore, and Mr. W. B. Wards, overseer of the Marton Experimental Area.

Grading of Export Butter and Cheese

Leading Dairy Factory Averages for 1939-40

Contributed by the DAIRY DIVISION.

BUTTER-MANUFACTURING companies which have obtained an average grade of 94 points or over and cheese-manufacturing companies which have obtained an average grade of 93 points or over are listed below.

Of the total 152 creameries or dual-plant factories manufacturing butter for export, 30 are included in the list as compared with 37 for the previous year, and of the 277 cheese-factories and dual-plant factories manufacturing cheese for export, 11 as compared with 10 for the previous year have averaged 93 points or over.

Of the total factories listed, 21 butter and six cheese factories are situated in the North Island, and nine butter and five cheese factories in the South Island.

BUTTER.

Company or Proprietor	Regd. No.	Brand.	Tonnage Graded.	Ave. Grade.
Kaikoura	302	Kai	318	94.791
Murchison	1,888	Airship	218	94.789
Rangitikei	1,360	Rangitikei	111	94.654
Rangiwahia	750	Quail	58	94.623
United	1,296	Whariti	238	94.594
Karamea	1,570	Karamea	197	94.584
Rodney	394	Rodney	652	94.570
Taihape	1,188	Tikapu	353	94.554
Konini	1,203	Konini	522	94.521
Rata	938	Rata	883	94.479
Awahuri	664	Red Rose	847	94.460
Collingwood	1,254	Golden Hills	165	94.424
Kuku-Manakau	905	Ohau	335	94.357
Golden Bay	146	Sovereign	616	94.321
Wairoa	1,345	Wairoa	229	94.308
Arahura	1,516	Arahura	29	94.303
Levin	910	Lake	1,028	94.298
Maungaturoto	1,407	Otamatea	1,241	94.283
Westland	145	Westland	302	94.219
Taieri and Peninsula	54	Sweet Briar	21	94.205
Bay of Islands	1,312	Bay of Islands	1,084	94.203
Wangaehu	1,326	Wangaehu	542	94.199
Kia Ora	926	Kia Ora	954	94.137
Kaikohe	40	Kaikohe	251	94.136
Inter-Wanganui	6	Inter-Wanganui	131	94.113
Mangorei	345	Mangorei	979	94.101
Rongotea	8	Rongotea	859	94.079
Kairanga	1,768	Longburn	522	94.063
Mauriceville	14	Mauriceville	781	94.052
Cheltenham	3	Pakeha	1,707	94.010

CHEESE.

Company or Proprietor	Regd. No.	Brand.	Tonnage Graded.	Ave. Grade.
Kaimata	992	The Oaks	406	93.688
Stirling	292	Stirling	265	93.463
Bell Block	488	Bell Block	407	93.349
Kaitangata	1,648	Kaitangata	89	93.237
Waimana	1,817	Waimana	84	93.173
Tokonui	656	Tokonui	72	93.161
Kahui	493	Kahui	245	93.132
Orari	254	Orari	228	93.109
North Taranaki	723	Flax	123	93.096
Milton	1,030	Milton	91	93.059
Oxford	15	Oxford	360	93.006

THE Director-General's PAGE

A New Feature

On this page it is proposed to outline each month some of the important activities of the Department of Agriculture. Since the establishment of the "Journal of Agriculture" in its new form it has achieved a widespread national circulation, and its pages have gone a long way towards bringing the Department in closer touch with the farming community. However, it is felt that the articles alone are not sufficient to give the farmer an adequate picture of the work of the Department, and with this issue we begin the "Director-General's Page" in the expectation that it will bring about a still closer association between the man on the land and officers of the Department.

Serpentine-Superphosphate

THE Fields Division of the Department has laid down 110 observational trials throughout the Dominion with the object of comparing results from the application of serpentine-superphosphate with responses from the use of lime and the various phosphates in common use in the different localities. The Division has also laid down 10 half-paddock grazing trials under which the production from serpentine-superphosphate and standard fertilisers will be compared.

More accurate figures of the production from serpentine-superphosphate in comparison with other fertilisers will be obtained from trials at Marton Experimental Area and Feilding Agricultural High School. By the end of the present planting season there will be at least 150 trials laid down with crops, including wheat, oats, barley, potatoes, turnips, and swedes.

In order that supplies of serpentine-superphosphate will be available to farmers early next year, arrangements are now being finalised for the establishment of a commercial drying and grinding plant in the Auckland district. This plant will have a capacity of 200 tons of ground rock per week working one shift of eght hours, and should be capable of meeting all autumn top-dressing requirements of the new fertiliser.

* * *

Cheese Change-over.

THE opening months of the 1940-41 dairying season will long be remembered, for one of the most sweeping changes the industry has been called upon to make was brought about.

The call from the United Kingdom Government for an increase of 15,000 tons or more in the output of cheese from the Dominion was received early in June. Immediately an organisation consisting of the Dairy Board and officers of the Dairy Division formulated plans for changing as many cream suppliers as could do so with the least expense and inconvenience to the supply of milk to cheese factories.

The responsibility for providing manufacturing equipment and the supply of milk-cans was placed on the cheese manufacturing companies, no easy task under present conditions, and the assistance rendered by them can be gauged by the success so far attained.

The co-operation received from the 1500-odd suppliers affected by the change-over is indicated by the fact that although compulsory powers were given to the Director of the Dairy Division to ensure that the necessary amount of milk would be delivered to the cheese factories, more than 90 per cent. of those concerned made the change voluntarily. The actual number of orders issued to date has been 110, and of these 32 were issued at the request of the recipients who wished to have them to support their action.

Appeals against orders have numbered 36, and where it was considered that the change-over would impose a hardship exemption has been granted, although the exemption has not been availed of in every case.

In practically all cases a certain amount of expense was incurred in making the change-over, and a number of the dairy companies concerned has financed suppliers who required assistance, and the necessary equipment of cans, coolers, etc., has been procured by the factories and made available to the suppliers, either by sale or hire.

Where the dairy companies were not prepared to undertake this responsibility arrangements were made by the Government with the State Advances Corporation for the Corporation to provide the money required at a low rate of interest on special terms for repayments.

Arrangements were also made, where required, for the payments to former cream suppliers to be made through the butter company from which they

had been changed over. The cheese companies, on the other hand, undertook to regard these suppliers as being on loan for the period in which their supply of milk was required to produce the quantity of cheese asked for by the United Kingdom Government.

Under this arrangement the suppliers changed over have not been required to take up shares in the cheese company, which will base its pay-out on ordinary charges for manufacture, including depreciation, repairs, and maintenance.

It was further provided by the Government that equipment such as milk-cans and coolers, whether purchased with the assistance of the dairy company or the State Advances Corporation, would be taken over by the Government at their assessed residual value if at the end of a given period the supplier changing over had not reasonably recovered the amount expended on dairy equipment. The items referred to have not, of course, been the only expense incurred.

It cannot yet be said with certainty that the minimum objective of 15,000 tons extra cheese will be reached. Indications are that, because of the difficulty of procuring the necessary number of milk-cans and cheese manufacturing equipment in the early weeks of the dairying season, through the lack of supplies of steel sheets, it is a question whether the desired quantity of cheese will be obtained, and it may be necessary to ask a further number of cream suppliers to change over as vat room becomes available in the cheese factories and further supplies of milk-cans are procurable from the manufacturers.

It is pleasing to note, however, that in spite of the loss of cream suppliers to creameries, in many cases a very severe loss, the output of butter has up till the present shown an increase on last season's output, due in a great measure to the bountiful season so far experienced.

A great deal of work has been put into the effort to meet the request of the United Kingdom Government, and the thanks of the Department are due to the suppliers, the dairy companies, and the Dairy Board for their assistance and co-operation in this effort.

* * *

Damage to Wool.

FOR very many years the trouble caused by the use of deleterious wool branding materials has been a subject of complaint from the wool buyers. This topic has been given wide publicity in the farming Press, but the trouble still continues undiminished. The actual monetary loss is difficult to estimate, but there is no doubt that it reaches a considerable sum. One estimate from a reliable source is that last season 2 per cent. of our greasy wool was spoilt by brands, and the value of good-type crossbred wool is lowered on this account. Other types of wool are also affected.

There is no need for this loss to continue, and the Department of Agriculture has under way a comprehensive trial of all the commercial marking fluids, raddles, and crayons, besides a variey of other concoctions used at times by farmers. It is not expected that very many of the commercial products will be found at fault, but it is essential to check up on this point before proceeding further in the campaign to eliminate the trouble.

* * *

Rabbit Control Subsidy.

IN conjunction with the National Service Department (Employment Division) a subsidy of £3/10/- per man-week is being paid on labour employed on rabbit destruction work. The subsidy may be applied for by rabbit boards, committees of farmers, individual farmers, or by county councils. All work to be undertaken under the scheme must be approved by the local stock inspector of the Department of Agriculture and the labour employed supplied or approved by the local officer of the National Service Department (Employment Division).

The scheme has been devised in order that rabbit destruction work may be continued with unceasing energy throughout the spring, summer and early autumn months, and not be confined to a few months in the year when the price of rabbit skins is the chief consideration.

Many will remember the rapid increase in the rabbit population which took place during and after the Great War, and, although the position today compares more than favourably with that period, there are indications of serious trouble ahead, particularly in some southern districts, if adequate organised destruction work is not undertaken. The scheme is now in operation, and will continue until March 31 next, when the normal winter work should come into operation, but should necessity arise in special cases consideration will be given to the continuance of the subsidy.

All work undertaken will be under the direction of the local inspectors of stock, to whom applications for assistance under the scheme should in the first instance be made.

* * *

The Pig Industry.

THE Livestock Division has for its objective the keeping of pigs on such a scale as to make them a dependable second source of income on dairy farms.

The present production of pig meat is about 50,000 tons. The production aimed at is a baconer for every cow, or approximately 75,000 tons of pig meat a year. The basis of this expansion is the greater use of farm crops which would make possible the full utilisation of dairy products.

Arrangements have been made for an increase of at least 10,000 tons of export pig meat this year. It is of the greatest importance that this extra supply should be forthcoming, in order to establish our claim to an extended market.

Intensive activity on the part of Departmental officers and the national pig organisation has resulted in a generous response from the farming community, and there is every indication that our objective will be realised.

* * *

Maize Crop

THE raising of our acreage of maize crops for grain from 7,600 acres to 11,000 acres in order to dispense with importations seems likely to be attained. In the achievement of this result it appears that the Maori farmers of the East Coast are playing an important part, and they are to be highly commended for the enthusiastic and energetic manner in which they have initiated a programme of maize-growing as a war effort.

A. D. McKay

DIRECTOR-GENERAL.

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

Watch Out for Red-water In Calves

IN the dairying districts, particularly in the South Auckland and Taranaki areas, a certain number of calves die each spring from red-water. So-called dietetic red-water occurs in cows before and after calving, and is usually associated with the feeding of excessive quantities of roots or with the spring flush of grass unbalanced by hay or other supplement. It is probable that in calves diet is also responsible. Some work done in Australia suggested that a certain type of bacterial infection was to blame, but this has not been confirmed elsewhere.

The occurrence of red-water in certain animals during the facial eczema epidemic of the 1938 autumn would indicate that in grass at a certain state of growth there may be a substance capable of breaking down the red cells of the blood. In red-water of any type the red cells of the blood are broken down somewhere in the body, and the red colouring matter is evacuated through the kidneys in the urine.

Calves may die at any age from one week, which is exceptional, up to six or eight weeks. Unless a post-mortem examination is made it is quite possible for several calves to die rather suddenly without the cause being suspected. If they are under close supervision the passage of discoloured urine, which may vary from bright red to port wine or almost black colour, may be noticed, and give a clue to the trouble.

The conditions under which deaths occur have usually been that calves are doing well, are being well fed on the whole or skim-milk (there seems no record of its occurrence in whey-fed calves), are getting some meal concentrate, and have access to a grazing of rapidly-growing type. Deaths may occur under other conditions, however, and in the absence of green feed, for example, very young calves. It is possible that the harmful substance is being eliminated by the cows in the milk itself. Some have considered that dirty, insanitary conditions were to blame, but the conditions may be good.

Symptoms

In most cases the affected calf continues to take its food. Within 24 to 48 hours of the onset it becomes weak and staggery, and the lining membranes of eyelids, nostrils, and mouth become pale. Breathing may be laboured. Changes in the urine (as described above) occur. Death in most cases takes place in one to three days.

On post-mortem examination of a dead calf any urine found in the bladder will be characteristically dark red; the kidneys are usually very

'All germs killed' —thanks to 'DETTOL'

Read this Stock Breeder's Report:

'Last year there were a number of still-born lambs and a high mortality rate amongst ewes was expected. When each lamb was removed; the uterus was syringed with Dettol. It was successful in every case and needed no further attention.'

A FREE BOOKLET *"Dettol in Veterinary Practice," will tell you of this new antiseptic and how to use it for the safe relief of many distressing conditions. Write to Reckitts (Over Sea) Ltd., (Pharmaceutical Dept. 1) 8 Victoria Street, Wellington.*

'DETTOL' THE MODERN ANTISEPTIC

TRADE MARK *As supplied to the Royal Veterinary College, London*

3

dark, particularly on surface, and sometimes swollen; the liver, on being cut into, is of a yellowish colour.

Treatment

Various treatments have been tried and with varying success. Much depends on early recognition of the trouble. The best results have been from the following procedure:—Carefully give a drench of 1 tablespoonful of common salt and 1 dessertspoonful of vegetable turpentine thoroughly dissolved in 6oz. of milk. Withhold milk for 24 hours, allowing frequent drinks of barley water or oatmeal water. Bring back on to milk gradually, first half water, increasing the percentage of milk daily. Keep the calf warm and comfortable, and restrict exercise.

Another treatment which gave strikingly good results in some cases and failed in others was dosing with teaspoonful doses of sulphate of iron in a drench. Citrate of iron and ammonia, 1oz doses of 6 per cent. solution, has also been tried, and is a useful tonic in the anaemia caused by red-water.

Control

Preventive measures are important, as the death rate may vary from one or two calves up to 20 or 30 in severe outbreaks. Where cases occur, grazing should be curtailed for a week or two, and a ration of good hay allowed if the calves are old enough. The milk should be properly rationed and fed in separate buckets. A level teaspoonful of common salt should be added to each feed for a week or so.

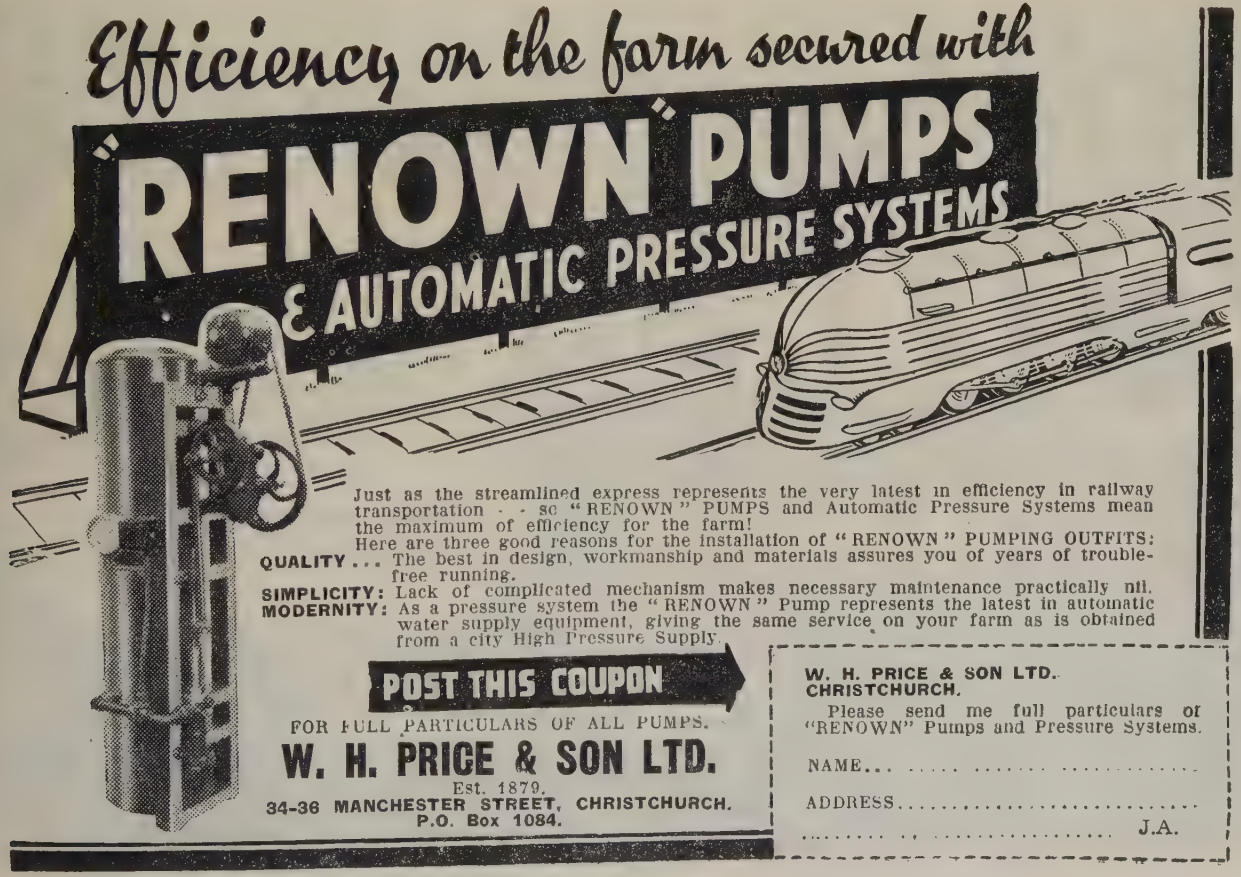
Keep a close watch on all calves to detect early cases.

—*D. MARSHALL, District Superintendent, Wellington.*

Navel-ill and Joint-ill in Newly-born Animals

NAVEL-ILL and joint-ill in newly-born animals is caused by the entrance into the system of the newly-born animal through its unclosed navel of germs which may give rise to the formation of pus or matter. These germs are widely distributed in nature, but are found in greater numbers and probably in a more virulent form on those places frequently soiled by animals, such as farmyards, lambing yards, or folds, etc., than in paddocks. For this reason, permanent foaling and calving boxes and lambing enclosures used frequently or regularly are more dangerous places than the pastures.

Affected animals are noticed a few days after birth to be moving stiffly and to be disinclined to walk or suck. They lie down continually, and are got on to their legs with difficulty.



Just as the streamlined express represents the very latest in efficiency in railway transportation - - so "RENOWN" PUMPS and Automatic Pressure Systems mean the maximum of efficiency for the farm!

Here are three good reasons for the installation of "RENOWN" PUMPING OUTFITS:

QUALITY ... The best in design, workmanship and materials assures you of years of trouble-free running.

SIMPLICITY: Lack of complicated mechanism makes necessary maintenance practically nil.

MODERNITY: As a pressure system the "RENOWN" Pump represents the latest in automatic water supply equipment, giving the same service on your farm as is obtained from a city High Pressure Supply.

POST THIS COUPON

FOR FULL PARTICULARS OF ALL PUMPS.

W. H. PRICE & SON LTD.

Est. 1879.

34-36 MANCHESTER STREET, CHRISTCHURCH.
P.O. Box 1084.

W. H. PRICE & SON LTD.
CHRISTCHURCH.

Please send me full particulars of "RENOWN" Pumps and Pressure Systems.

NAME... ....

ADDRESS.....

..... J.A.

Their joints begin to swell, and often it is apparent that abscesses have formed, the hock, stifle, points of the shoulder, and knee, being the joints usually affected. In the worst cases abscesses form in different parts of the body, particularly in the liver and kidney, and the animal dies from exhaustion or from the poisons produced by the germs of the disease.

In New Zealand the disease is fortunately rare in calves and lambs, due mainly to these animals giving birth to the young in the paddocks. A few serious outbreaks have been seen where stud ewes have been confined in enclosures or pens during lambing.

As the calving and lambing season has passed, the disease is of most interest at the present time to owners of mares expecting foals.

Prevention

Efforts should be made to prevent the occurrence of cases on farms by preventing the germs from gaining access to the navels of newly-born foals. This object is best attained by tying the navel string (umbilical cord) immediately after birth with a piece of strong string which has been soaked in 5 per cent. solution of carbolic acid in water or in any equally effective disinfectant, and by applying a disinfectant to the navel in the form of an ointment or in solution.

If the mare must be housed for foaling it is essential to see that a clean, disinfected, and well-bedded box is provided; if possible, it is better to allow the mare to foal in a clean grass paddock with a good sole of fresh pasture growth.

Treatment

The disease in foals should be treated by a veterinary surgeon, for the animal's life and future usefulness often depend upon careful nursing, medicinal, and even surgical treatment. Early advice and treatment should be sought and applied, as delay is dangerous.

Pigs Poisoned by Eating Ngaio Leaves

THE foliage of many of our native trees is much appreciated by stock in periods of scarcity, and cattle turned out into standing bush for the winter come out well in the spring.

Few cases of poisoning occur as a result of bush grazing, but in districts where ngaio trees are growing in open country, deaths of cattle are reported from time to time, which, on investigation, are found to be due to the ingestion of ngaio leaves. Generally, branches have been broken off the trees by heavy gales, and the cattle, being hungry, have readily eaten the

KILL INTERNAL PARASITES!
CLEANSO
(COBALTISED)
DRENCH
CLEANSO has proved itself a thoroughly reliable Drench for the several types of worms which cause such heavy mortality among sheep and lambs . . . is immediately effective . . . simple to use . . . economical to a degree . . . Tonic properties, together with Cobalt, help maintain a healthy and virile flock.
(Registered under the Stock Remedies Act.)
New Zealand Agents—
Wright, Stephenson & Co., Ltd.,
Abraham & Williams, Ltd.,
All Branches.

leaves and twigs. It is believed that the poisonous principle responsible is a volatile oil.

An unusual case came under notice in which store pigs were poisoned after eating ngaio leaves. At 10 a.m. the pigs were found struggling on the ground unable to rise to their feet, and within four hours the animals died in convulsions. On opening the stomachs they were found to contain grass, fibrous roots, earth, and some whitish, fleshy particles which, on investigation, proved to be midribs of ngaio leaves. The pigs were running at large, and during the previous night a heavy wind had blown some leaves off a solitary, stunted ngaio tree. The hungry pigs had evidently appreciated the succulent diet the fleshy leaves afforded them, with fatal results.

—T. H. HANKIN, Veterinarian, Whangarei.

Feeding Pet Lambs

T.H. (HAWKE'S BAY):—

Would you please give me some information on the feeding of pet lambs? I saw some details in an agricultural journal some years ago, but have unfortunately lost the copy.

LIVESTOCK DIVISION:—

Points to attend to are:—Strict cleanliness of feeding bottles or utensils, always feeding milk at same temperature, and feeding sufficiently often, without exceeding the total quantity necessary.

For very young lambs the feeding bottle is most suitable; the opening in the nipple should not be too large, or the lamb gets the milk too quickly. Ewe's milk is somewhat richer both in fat and in other solids than cow's milk, so at first the whole cow's milk should be fed undiluted. Later, a little skim could be added, say, at four to six weeks. Feed three to four pints daily, divided at first into six feeds, which number can be reduced by degrees. After a month to six weeks the lamb could have a little oatmeal porridge added to one feed.

Should the milk supply be limited it could be somewhat reduced after six to eight weeks, and a small amount up to ¼lb of a mixture, say, of crushed oats, bran, and meat-meal fed either dry or as porridge. Much will depend on quality of grazing available. Drinking water should be available in hot weather.

Once the lambs start grazing, should all available feed be short and green, tie a bundle of hay on a fence where they can pick it.

North Island Lambing Estimates

Current Season Is Highest Since 1936

LAMBING estimates in the North Island for the current season are the highest since 1936.

From information supplied by the various Inspectors of Stock, the average rate of lambing for the current season in the North Island is estimated at 89.01 per cent., compared with 84.40 per cent. in 1939. This is the highest estimate since 1936, when the estimate of 90.50 per cent. proved slightly below the actual lambing percentage of 91.48 per cent.

With 10,917,684 breeding ewes in the North Island, as shown in the 1940 sheep return, the number of lambs this season is estimated at 9,717,488.

South Island and Dominion returns will be given in next month's issue of the "Journal."

The following is the estimated percentage of lambing in the North Island for the year 1940, and a statement for the previous five years showing also the actual number of lambs tailed

District	Breeding Ewes	Estimated Percentage of Lambs	Estimated Number of Lambs
Auckland	2,482,604	92.41	2,294,247
East Coast — Hawke's Bay	4,293,150	87.86	3,771,850
West Coast —Wellington	4,141,930	88.16	3,651,391
NORTH ISLAND TOTALS:	10,917,684	89.01	9,717,488

Year	Number of Breeding Ewes	Estimated Average Lambing Percentage	Estimated Number of Lambs	Actual Number of Lambs Tailed
1939	10,889,802	84.40	9,190,994	9,510,608
1938	10,735,829	80.11	8,600,625	9,068,741
1937	10,570,388	86.52	9,145,849	9,401,496
1936	10,300,826	90.50	9,322,476	9,423,240
1935	9,697,231	83.68	8,114,361	8,500,075

Abnormal Birth

J.W. (OAMARU):—

I have two questions on very different subjects which I would like answered in your "Journal," as it caters for all tastes.

(a) In a recent "Journal" you mention greenfeed for poultry after tea. Do you not recommend greenfeed with the mash in the morning?

(b) I have a cow which was due to calf. At about six weeks before calving she had a cord hanging out. That night she gave birth to a dead putrified calf about the size of a 10lb honey tin. There were legs to each joint about as heavy and as long as a man's finger. She was not sick in herself, and it has had no effect on her milk yield. Is this abortion? It was quite dry and hard.

LIVESTOCK DIVISION:—

Chopped-up greenfood may be used in the morning mash ration, about 10

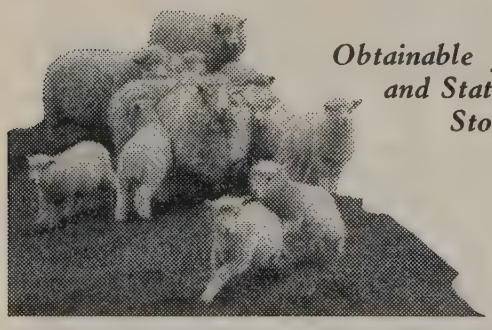
4 FAMOUS SHEEP DIPS

each having three important features

1. Destroys parasites present on the sheep at dipping.
2. Sterilises the tick "egg."
3. Deposits material in the fleece to give maximum protection against re-infection from all parasites.

Many of the most famous flocks in the World are dipped annually in one or other of these preparations. Easy to mix, do not remove the natural protective grease from the fleece, and stimulate growth of healthy wool.

(Registered Pursuant to Stock Remedies Act, 1934).



Obtainable from your Stock and Station Agent or Storekeeper.

COOPER'S
Quick-Acting
POWDER

McDOUGALL'S
PREMIER POWDER
Immediate Action

QUIBELL'S
SPECIAL POWDER
Prompt Action

HIGHLAND
IMPROVED POWDER
Speedy Acting

FEED WELL — CULL WELL — DIP WELL — ALL WILL BE WELL

COOPER, McDOUGALL and ROBERTSON (N.Z.) LTD., - - CUSTOMS STREET E., AUCKLAND, C.1.

per cent. to 15 per cent. greenfood being sufficient when this method is adopted. It is really immaterial whether you include greenfood in the mash or whether it is fed separately. It is the practice at Wallaceville Poultry Station to feed it after the last meal at night, as experience showed that the birds appeared to consume it more ravenously at that time than when it was fed during the day. However, it is essential that poultry receive greenfood once a day, and it may be fed when it is convenient to yourself.

The description given by you of the premature birth of a deformed calf is not the typical evidence looked for in the case of a cow affected with the disease known as contagious abortion. The premature birth would be correctly described as abortion, but the circumstances suggest that the foetus was deformed and probably mummified at an early stage in its development. A mummified foetus, whose development is arrested, would act as foreign matter in the womb, and the natural result to be expected is the expulsion of the foetus.

In the more regular type of premature birth due to infection with the organism of contagious abortion the foetus develops normally up to the actual time of abortion and the calf may be alive at the time of birth, even though one or two months premature. In contagious abortion there is evidence of a discharge of a fairly large amount of brown matter, which has not been described by you.

The description given by you suggests that the cow was carrying a mummified foetus of a bull dog abnormality type, not uncommonly seen in some of the dairying districts.

Feeding a Weak Piglet

FARMER'S WIFE (NORTHLAND):—

I would be grateful if you could assist me in the following problem:—

My husband brought in a day-old piglet, the small one of a litter of six (sow's second litter). It did not seem to be getting a fair chance, and was weak. I put it in a small box, and after feeding it, wrapped it up in pieces of sugar bag and put it in a warm place. I have been spoon-feeding it every 1½ hours or 2 hours with about 2 or 3 tablespoons of top-milk and hot water with a little sugar added. It seems to be gaining in strength, is more active, and will soon drink out of a small dish.

Would it be wise to alter the way I am feeding it, and also would the addition of a little meat-meal, pollard or molasses hurt it at about four weeks old? To the man with a large herd and a correspondingly large number of pigs I suppose it wouldn't be worth bothering about, but as we are only in a small way, every piglet we can rear is a help, and I would like to rear this little chap if economically possible.

LIVESTOCK DIVISION:—

Your procedure is quite sound. Sows' milk is about one and a half times as rich in fat and protein as cows' milk, so that the use of top-milk or rich Jersey milk is advisable. It does not seem desirable to add any water, as this dilutes the protein still further. The addition of a little sugar does no harm. Your practice of feeding a little and often, especially in the early stages, is the essence of success in rearing young pigs. As soon as it starts drinking out of a dish put a small quantity of meat-meal and pollard in the milk. At three weeks it should take about 1 ounce of both meat-meal and pollard daily, and this amount should be increased each week until the pig is getting half a pound of meat-meal, half a pound of pollard, and about three-quarters to one gallon of milk daily at eight weeks. If this amount of milk is not available, replace the milk at the rate of 1 lb. pollard to every gallon of milk.

Molasses is not advisable unless you have no milk. After about five weeks most of the milk could be skim-milk, but a pint of whole-milk daily would be advisable until the pig was eight weeks old. As it grows increase its feed by ½ a gallon of skim-milk at the end of every fortnight. At 16 weeks it ought to be getting 4 lb. of feed, say half a pound of meat-meal, half a pound of barley or pollard, and three gallons of skim-milk.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

CHAMPION SPARK PLUGS
Bring BETTER HILL CLIMBING
Good hot sparks from Champion spark plugs will give your car the kind of ignition it needs for a smooth, even pull up a hill. Champions allow less carbon to form, so you get more speed, more power, more economy. Champions save you money!
CHAMPION
SPARK PLUG
An Empire product—made in Windsor, Canada
71
Distributors: HOPE GIBBONS LTD., Wgton., Chch., Auck.
Give a Set of Champion Spark Plugs this Christmas.

Inbreeding of Cattle

F.S. (AUCKLAND),—

Would you please give me your views on inbreeding with a pedigree Jersey bull and grade cows? I appreciate your "Journal" very much.

LIVESTOCK DIVISION:—

The inbreeding of cattle is carried out with the idea of improving the type of animals in the herd. It has its opponents as well as its advocates, the opponents stating that inbreeding leads to sterility and debility, with the result that the inbred animals are very prone to fall prey to many diseases.

Many breeders, however, do a certain amount of inbreeding with the idea of fixing desirable points in their animals, and, provided it is carried out intelligently and carefully the results are, in many cases, quite satisfactory. It must be fully reaised, however, that although the aim is to bring out and fix the good points of the parents, inbreeding will also bring out and fix the bad points, and in this way may lead to disappointments to the breeder.

When attempting anything in the way of inbreeding, the main point, and one that must receive very careful consideration, is constitution. The improved cow is called upon to produce more and more, and if there is the slightest weakness in her constitution, she will break down and soon become a non-paying member of the herd. The success of some of our greatest breeders of cattle has been due in no small measure to the fact that they are sound judges, and inbreeding in their hands has led to satisfactory results and improvements in the herds.

To inbreed, as you suggest, between a pedigree bull and grade cow is perhaps taking just a little too much risk, unless care is taken in selecting the cows that are mated to the bull. Constitution must be the first consideration, and then type. No cow should be mated with him that shows any weakness that the bull himself shows. Production will no doubt also receive due consideration, but it must be realised that no bull, no matter how good he is, can be expected to sire a champion out of a poor producing cow.

Use of Boar For Breeding

"INQUIRER" (WESTLAND):—

Will you please tell me through your "Journal" the following:—We have a young boar four months old, well fed, and in good condition. How old should he be before being mated with sows?

LIVESTOCK DIVISION:—

It is common practice to allow the boar to be at least six months of age before he is used for service. It is desirable to confine the service to maiden sows, and even then the boar requires to be used sparingly during the first season. If several sows are to be served it is advisable to allow as long an interval as possible between services when using a young boar.

Good feeding is necessary to keep the boar fit and active. Sluggishness is frequently seen in pigs which have been heavily fed and actually are in too fat condition.

SHEEP-FARMERS, SAFEGUARD THE QUALITY OF YOUR CLIP by the use of

Elliotts "UDIP"

QUICK ACTING

THE ARSENICAL FULL STRENGTH *SHEEP DIPPING POWDER* . . . .

"UDIP" ensures effective, low cost eradication of external parasites, sterilises tick eggs, and protects against re-infection.

Its desirable "airfloat" fineness permits of rapid and even saturation of the fleece, without affecting the natural grease in the wool.

"UDIP" is easily mixed and promotes healthy wool growth.

Millions of sheep in Australia and New Zealand are dipped effectively at low cost each year with "UDIP," and farmers are able to command higher prices for their wool. This is real proof of its quality.

The low price of "UDIP" (only 80/- per case) is made possible because Elliott's buy their raw materials in huge quantities in the markets of the world, and handle every stage of manufacture in their own 18-acre works and laboratories.

80/- PER CASE (100lbs.) in 10 Sisalkraft Air and Waterproof Containers, each 10 lbs. (Subject to freight from main centres.)

Write for full information and supplies to: Sole N.Z. Distributors for "UDIP"

PREMIER PRODUCTS LIMITED - Huddart Parker Buildings, WELLINGTON

Farm Practice and Management

Contributed by Officers of the Fields Division

Prevention of Slug Damage in Potatoes

IN the January, 1939, issue of the "Journal of Agriculture" Mr. W. Cottier, Entomologist, Plant Research Bureau, discussed the use of "Meta" under the title of "New Poison Bait for Slugs." Overseas experiments indicate that it is very effective, and it has several advantages over the poison baits commonly used.

Potato growers in some parts of England and Scotland incur losses of one to four tons per acre through slug damage, and in New Zealand there are occasionally instances where this pest causes real economic loss.

A few seasons ago many wheat crops were severely damaged during winter and early spring, and investigation proved that slugs were the cause. In practically every instance the wheat crop followed a crop of peas, and, in addition, we experienced a comparatively wet summer and autumn.

Slugs are able to live and breed all the year round, but multiplication is greatest in late summer and early autumn. A pea crop or a crop of red clover cut for seed provides the ideal environment, as there is shelter from their natural enemies—birds—ample food and a humid atmosphere at ground level.

Slugs are voracious feeders, and they live on all kinds of vegetation, both above and below ground. In young wheat crops they shelter below the surface under clods in the daytime and come up at night to feed on the leaves. The soft tissue at the tip of the leaf is stripped away, and presents a ragged appearance. Usually, slime tracks can be seen in the morning, shining in the sun after a dew. A visit to the crop on a calm night with a lamp or electric torch will confirm any doubts if slugs are present.

Table potatoes damaged by slugs. The centre tuber has a piece cut away to show the slug still in the hole.

Experience with Potato Crop

The accompanying photograph shows some potato tubers taken from a crop which was so severely attacked that it was almost impossible to make a fair-average-quality sample of the tables, while the seed were definitely unsaleable. When the crop was lifted a few counts taken along the rows behind the digger revealed that more than 50 per cent. of the tubers were marked. Occasional slugs were found in the tubers, and in many of the holes there were batches of eggs. Inquiry revealed that the paddock had been in red clover before ploughing up in winter for the potato crop. In each of the two preceding summers a crop of clover hay and a crop of seed had been taken. Thus, a big population of slugs had been built up, and they remained in the ground until the next summer when the potato tubers developed.

This was rather an extreme case, but other potato growers have suffered losses from damaged tubers, and the adoption of control measures is definitely warranted whenever this pest is likely to be prevalent. Growers of certified seed often experience difficulty in sorting lines up to certification standard, for although slug markings are dry and do not induce dry rot, any appreciable number in the sample makes it unattractive to the buyer.

Harboured by Hedges

Gorse hedges are common around potato fields in Canterbury, and several growers have remarked that the most damage is to be found in the outside rows near the fence. The gorse fence, of course, provides an ideal breeding ground for slugs. There is also the possibility that this pest will migrate from one paddock to another in search of food, and attacks should be looked for in potatoes grown near fields shut for hay or seed.

Early varieties of potatoes are not usually affected, as they are lifted while there is still ample vegetation about for the slugs. In later maturing crops the slugs breed under the shelter of the leaves in late summer, and when the tops die down food and shelter is reduced, and they go down to the tubers.

Use of "Meta"

To avoid damage to the crop the slugs must be dealt with before the tops die down. When "Meta" fuel is used as a bait the recommendations are to apply at intervals of two to three weeks, repeating the treatment two or three times according to amount of infestation. One or two farmers who have tried out "Meta" mixed with bran in the proportion of one tablet to a quart of bran have had good results.

Where the slugs are present only in the fences, good control can be secured by spreading the bait along the four outside rows, but if they are all over the paddock the mixture should be applied at the rate of 25 lb. per acre.

"Meta" fuel can be purchased from hardware stores in packets containing 50 tablets at a cost of 3/6. Each tablet is white, and should be crushed up before mixing with bran. If the ground is dry it is as well to moisten the mixture with water, but it acts just as well dry if the surface soil is moist. Not only is it poisonous to slugs, but also it attracts them, and it is not harmful to fowls or other animals.

My experiences with it in the garden are that one good clean-up of the slugs among lettuces, etc., in the early summer disposes of further trouble for the season.

Shelter Under Rubbish

Valuable stands of Montgomery red clover in wet seasons often produce a big bulk of material and smother themselves out. Some stands I have examined after a heavy crop of seed has been harvested were found to be infested with slugs sheltering under the rubbish left on the paddock. The slugs feed on the new growth coming away at the crowns, and they also eat the leaves of young self-sown seedlings. Harrowing and raking off the rubbish deprives the slugs of shelter and allows birds to take their toll. Broadcast with bran or sand, "Meta" should be well worthy of a trial in severe cases.

Although experiences with this new poison bait in New Zealand are few, all reports are very complimentary, and this article may induce others to give it a trial.

—A. S. NASH, Instructor in Agriculture, Rangiora.

RUGGED ECONOMICAL POWER

TD6 SURPASSES ALL EXPECTATIONS

This latest addition to the McCormick-Deering TracTractors—the TD6—has now proved itself under New Zealand conditions. Owners are astonished at the power of this little crawler—and the small amount of Diesel fuel it uses. They are finding it a flexible, easily manoeuvred machine, packed full of economical power to meet an unusually large number of power demands. If you need economical power, make inquiries about the TD6. Fill in the coupon and mail TO-DAY.

McCORMICK-DEERING

International Harvester Company of N.Z. Ltd., Auckland, Palmerston North, Wellington, Christchurch, Dunedin.

"McCORMICK-DEERING,"
P.O. Box 563, CHRISTCHURCH.
Please send me information about the TD6.

Name .....

Address ..... J.A.

Feeding and Stocking on Irrigated Areas

THE limiting factor to the number of stock that a farm can carry is determined by the amount of feed available during the leanest period of the year—that is, either the dry summer months, when feed is burnt up, or during the winter, when growth is dormant, or a combination of both of these periods.

The irrigation of land subject to dry summer conditions allows heavier stocking from a given area and, as one would expect, demands more careful management. This is only natural, for, apart from the extra stock carried, an irrigated holding represents more capital investment than probably any other class of holding of the same size. This is shown in the extra cost of construction and maintenance of water races, levelling and preparing paddocks, and subdivision. To this must also be added the annual cost of water itself, and probably that for extra labour required.

Compensating Returns

Although costs per acre are higher under irrigation, the returns under good management more than compensate for these higher costs. The costs of water, labour, and interest are fairly constant, but through poor maintenance or misfortune the returns can be more quickly eaten up by the costs under irrigation than on an unirrigated holding.

Poor management or misfortune may be cited as—(1) Insufficient supplies of winter feed due to an exceptionally severe winter, or a late spring causing losses with breeding stock and their young through undernourishment, and (2) overstocking, with its attendant diseases and losses. In other words, although costs are high, per acre production more than makes up for this provided adequate provision is made for the lean period of the year.

While a farm is never stocked up to the full capacity of the spring growth without irrigation, under irrigation the stocking is much nearer this point and is carried on for the greater part of the year. This in turn calls for greater care in estimating and producing the necessary amount of winter feed required. Consequently, the first care of an irrigator should be the production of sufficient quantities of hay and ensilage.

Provision Of Reserves

On a survey taken on a number of farms on the Galloway Flat, Central Otago * the only farm which had definite reserves of hay and ensilage—that is, each year was in a position to sell hay—had one-third of its area in lucerne, which was used for hay production. On the basis of the above survey and from experience, one-quarter to one-third of the area under irrigation may be in lucerne or red clover to produce hay and ensilage. Good supplies of these crops form the best insurance a farmer can have against stock losses.

In Central Otago the common practice is to feed the hay first, and as the ewes and dairy cows are coming nearer to profit the more laxative and succulent ensilage is fed, which also stimulates milk production. Mangolds, turnips, and carrots (if available) are welcome additions to the hay and ensilage. The average Central Otago

*Journal of Agriculture, Jan., 1936, page 44.

ACE "DAIRY SPECIAL" ELECTRIC HEATER
Economical Efficient

MORE FEATURES THAN ANY OTHER DAIRY HEATER
—AT NO EXTRA COST!
Enquire from your Agent or send for leaflet
SPEEDWAY
STEAM PRODUCTS LTD.,
51 Albert Street, Auckland.
South Island Distributors:
A. H. Turnbull & Co. Ltd., Christchurch.

BELOW PAR SOME DAYS?

Run down? Mysteriously below par some days? Slack after a late night? Feel you need more sleep? Occasional headaches?
All signs of constipation.
But you are perfectly "regular"? So are lots of people who nevertheless are constipated.
Elimination must be complete as well as regular. If it isn't, poisons remain, get into the blood, sap your vigour.
A prescription widely recommended by doctors is Kruschen Salts. Doctors do not prescribe secret remedies, or habit-forming drugs. Kruschen has their confidence because the analysis is on every bottle. They know what they are prescribing. And their medical knowledge tells them that Kruschen is unalterably right for the condition to be relieved. There is nothing better, and nothing more to be known about constipation and its relief. In a word . . .
YOU'LL FEEL ALL THE BETTER FOR A PINCH OF
KRUSCHEN
Take Kruschen in tea or hot water.
2/5 a bottle at Chemists and Stores.
K1.740

irrigated farm is mainly a grazing proposition, with very little cultivation carried out, and the production of roots is not general.

Lack of growth due to drought conditions does not affect the irrigated areas, but as frequently only a portion of the farm is under irrigation, a summer and autumn drought may mean the concentration of all the stock on to the irrigated land. While this does not give rise to worry for short periods, a point can be reached when these heavily-stocked pastures begin to become dirty, and foot-rot may make its appearance, as irrigation of the areas must be continued. Under these conditions surplus hay and ensilage will relieve the position, and good sub-division will allow rotational grazing with definite spelling and cleaning up of paddocks to be carried out. A permanent walk-through foot-rot bath in the sheep yards will be a good investment on any irrigated farm.

Carrying Capacity

The carrying capacity of irrigated land is a very controversial subject, and no fixed, safe figure can be given, as this depends mainly on the weather conditions prevailing at the time. On Galloway Flat there is little difficulty in carrying a beast per acre of the total area with more than half of them dairy cows. Included in the total area are the hay paddocks.

With sheep, one finds a tremendous variation in carrying capacity, although four to five breeding ewes per acre appears to be a reasonably safe figure under normal Central Otago conditions where the lambs can be got away fat off the grass. Under poor conditions stocking at these figures has given trouble, and on the other hand the writer has seen eight ewes per acre and their lambs come through the season well.

Under conditions of bright sunshine, short controlled growth and rotational grazing, heavy stocking can be safely practised, but with grass growth becoming long and dull muggy weather prevailing, internal parasites and foot-rot may cause considerable worry and trouble.

—G. G. CALDER, Instructor in Agriculture, Alexandra.

A Substitute for Corrugated Iron

MANY farmers will be concerned at the shortage of roofing iron during the present emergency, and the following suggestion is offered as a useful temporary substitute.

On many farms small sheds, either for poultry, implements, hay, or some other purpose, are occasionally required at short notice. These can be built from short ends of timber, which provide the framework, and covered by superphosphate bags drawn tightly over this framework and treated as follows:—

Procure the listed materials in the proportions given.

Cement	12lb.
Salt	1lb.
Lime	2lb.
Alum	½lb.
Bluestone	4oz.
Water	1¼ gallons

Sieve the salt and lime through a fine mesh sieve to destroy lumps and remove any pieces of rock. Add the water slowly, keeping the mixture stirred. Then add the cement, and stir thoroughly during the process. The alum and half the bluestone are finally added, and the whole mixture well stirred.

Take the remaining bluestone and dissolve it in 1¼ gallons of fresh water. With this solution, thoroughly wet the sacking, using a whitewash brush. The mixture should then be quickly applied to the outside, then the inside, and finally to the outside again before the first coat has dried.

Sheds so treated are quite waterproof, and the bluestone greatly lengthens the life of the sacking. Moreover, as the sacking shrinks with the dressing, it assumes quite an attractive appearance, which may be intensified by adding pigment to the mixture. Any pigment such as used in concrete floors would suit.

In the Tauranga district sheds of this type have been known to give useful service for a number of years.

In order to assess the quantities required for any shed, after the sacking has been placed in position, thoroughly wet it with fresh water. Should this take 2½ gallons, one would realise that double the listed quantities would be required. Similarly, if 5 gallons were needed, four times the quantities of lime, salt, cement, alum, and bluestone would be required.

—C. WALKER, Instructor in Agriculture, Thames.

SCOTCH WHISKY
"BLACK & WHITE"

It's the Scotch!

Growing Mangolds in the Southern King Country

MANY farmers are ceasing to grow root crops and are depending on hay and silage for their supplementary winter feed. This practice may be quite good on fully developed farms, but even there the addition of a root crop will handsomely repay the extra labour entailed.

Mangolds are not affected by such diseases as dry rot and club root, and as these are the more serious diseases of turnips, mangolds can be grown with success where swedes or turnips may fail.

There are two methods adopted in growing mangolds:—(1) Sowing the seed thickly in the garden and transplanting the young plants, and (2) sowing the seed in 28-inch drills in the field.

The first method is used successfully in the districts around Auckland, and appears to give good results. The second method is preferred by the writer, but with this method the young plants must not be neglected. As soon as the seed has germinated the young plants should be thinned, leaving one plant every 10 to 12 inches. It is good practice before thinning to cut away the soil from the plants with a cultivator, as this makes the thinning much easier. Further, inter-row cultivation every two to three weeks until the leaves of the mangolds straddle the rows and the shading controls the weeds should be carried out.

About four to six weeks after thinning, or perhaps twice before Christmas, all weeds between the plants should be hoed out by hand. By Christmas time the leaves should straddle the rows, and as the shading controls the weeds, inter-row cultivation is discontinued, as more damage would be done to the mangolds and leaves than to the weeds.

Mangolds grow best in a rich, fertile, well-drained, friable soil, but with adequate manuring they can be successfully raised on a wide range of soil types.

The seed is sown at the rate of 5lb to 6lb per acre, and the fertiliser at about 6cwt to 8cwt per acre. Good results are obtained from a mixture of half and half superphosphate and blood and bone. A little salt or 30 per cent. potash salts may be added to this, as mangolds are one of the few plants which like salty conditions.

A good crop of mangolds ready for pitting.

With mangolds, always remember that a small area well cultivated and tended will give a return far greater than an area four times the size but not adequately cared for.

There is one more point which should be remembered—before feeding, mangolds should be ripened. Pull the mangolds and pit them for at least three weeks before feeding out.

—W. T. BROWN, Fields Instructor, Taumarunui.

The Curved Haystack

THE illustration shows a novelty in haystacks which is becoming popular in the Hunua, Auckland, district. The haystacks are curved to form about one-quarter of a circle.

One reason for building them in this way is obvious—to facilitate building and lessen the number of hands on the stack where mechanical means of a certain type are used for hoisting the hay. Wherever the mast and boom or fork type of lift is used—or any lift where the hay is swung in a circle as it is raised on to the stack—then the curved haystack will lessen the work, for, when building such a stack, the hay can be dropped whenever it is required and there is no need for the labour in forking the hay from the centre to the ends of the stack.

There may be other advantages in the use of the curved haystack. For instance, they could be used as a temporary shelter for very young stock if the stack were built so that the convex side faced the wind. Also it is probable that there would be less tendency of such stacks to topple over.

—J. E. BELL, Instructor in Agriculture, Auckland.

The Orchard and Vineyard

Contributed by the Horticulture Division

Orchard Notes

Principal Work in the Orchard

THE principal work in the orchard during the month is as follows:—Spraying, cultivation, thinning the apple crop, preparation for the fruit season.

Spraying

The spraying programme as outlined in previous notes will need to be carried out. Certain modifications or alterations may be necessary, governed mainly by weather conditions and the incidence of disease.

The spray pump is the orchardist's defence. With it he can control the myriad hosts of invading pests. There are several divisions to be fought, namely:—(1) The active, marauding battalions of chewing insects; (2) The slower, compact multitudes of sucking insects; (3) The various fungous diseases.

These have all been previously mentioned, and action should be taken accordingly.

Note: (a) The orchardist who is always grumbling at ineffective sprays should examine his own work and see if the deficiency is not there. (b) Thrift is at times the worst economy, such as when the orchardist uses worn nozzles. He may save buying new ones for a while, but in a day his waste may be more than their cost, to say nothing of the inefficient way in which the work has been done.

Cultivation

In most localities cultivation of the soil in the orchard should be regarded as an important feature of the season's work, and should be continued throughout the summer months. Each major operation in the orchard should not only be done at the correct time, but should also be done thoroughly. An orchard with the soil well worked and free from weeds and with the trees looking clean and healthy and carrying a heavy crop of well-developed fruit is most attractive.

On the other hand, a neglected orchard overrun with weeds and other growth, and with the trees stunted and unhealthy is not by any means a welcome sight. Growers are therefore advised to keep the soil in such a condition as will lead not only to increased profit, but will also be more attractive in appearance.

Thinning the Apple Crop

As there is an ever-increasing demand for quality fruit, some attention should be given to thinning the apple crop where the setting has been heavy. Consideration should be given to varieties that have a very short stem, such as Gravenstein.

If no thinning is done, the result will be that a great deal of the fruit will be pushed off the tree as it develops in size. It will be an advantage to thin to single fruits, as by so doing the fruit will be of a more even size and more attractive to the buyer. Other varieties such as Golden Delicious, Dougherty, Rome Beauty, which have long stems, can be left with two and even three fruits in each cluster if thought desirable. This is only a guiding principle, as no hard and fast rule can be laid down, and the work is governed mainly by the percentage of buds which have set and by the vigour and ability of the tree to produce the fruit.

Preparation for Fruit Season

Every effort should be made to have things in readiness for the coming fruit season by having on hand a good supply of well-seasoned fruit cases, wrapping paper, and other essential material that may be required.

As all fruit is now graded and packed before it is sent to the market it may not be out of place to offer a few words of advice to any young members of the fruitgrowing community. If efficiency is desired in grading and packing, contact with the Orchard Instructor for your district, who will arrange classes which you can attend, and this will enable you to become more efficient as a grader or packer.

A few points of advice are:—

(1) Prepare for every phase of orchard work well in advance.

(2) Whatever you do, try to do it much better than you have done before.

(3) Try to learn by the mistakes of others as well as by their successes.

(4) As you have opportunity, discuss your problems with others.

(5) If you have been successful, try and get others interested in your success. Always remember you may be glad of advice or assistance at some future time.

Silver Blight

A great deal of experimental work has been done in order to find a possible cure for silver blight, but so far, nothing has been successful. Many cures have been reported in the past, but as the result of tests carried out personally, I have had to report them as complete failures.

In 1915 a well-known horticulturist reported having cured completely nectarine trees by an application of 3lb of sulphate of iron around the trees and working it into the soil. Obser-

vations were made the following year, and the result was nil. Later, heavy dressing of flowers of sulphur around the infected trees was reported to have effected a cure. When observations were made the following year the trees were heavily infected.

About 1927 wonderful results were reported after placing one dessertspoonful of finely-powdered bluestone into the tree. A half-inch hole was bored at an angle of about 60 degrees into the trunk of the tree, and into this hole the powdered bluestone was placed; the hole was then plugged with cork, clay, or putty. The result was that all the foliage fell from the limbs infected with silver blight. The new foliage which grew subsequently was infected the following year.

One has to state, therefore, that up to the present the only known method of dealing wtih silver blight is to cut cut and burn the tree if infection is severe.

—L. PAYNTER, District Supervisor, Auckland.

Citrus Notes

Remedies for Diseases and Pests

CITRUS diseases which cannot be controlled by normal spraying practices require to be recognised by every citrus grower and the necessary remedial treatments undertaken. These diseases may be classified as follows:—

Fungous Diseases.—Bark-blotch, collar-rot, brown-rot, sclerotinia.

Insect pests.—Citrus-borer, dicky-rice-weevil, cicada.

Bacterial Diseases. — Citrus-canker, citrus-blast.

Physiological Diseases.—Frost-injury, hail-injury, sun-scald, gum-spot, oil-spot, mottle-leaf, and spray-burn.

Bark-blotch (*Asochyta corticola*) causes severe losses in citrus orchards if it is not recognised early and treatment given. The foliage turns yellow and leaves fall prematurely, but the chief characteristic is the condition of the tree bark, which turns brown and flakes off with practically no gumming. All diseased tissues must be removed with a sharp knife and then burnt. The clean bark should then be painted with Bordeaux mixture or acidulated mercurial chloride, 1 part in 1000, and approved bituministic paint. As this disease enters through injury, care

SPRAYING MACHINERY for applying

ALL WASHES AND DUSTS, LIMEWASH, CREOSOTE AND DISINFECTANTS

THERE IS THE RIGHT MACHINE FOR EVERY JOB — ASK A FRIEND WHO IS USING A "VERMOREL" SPRAYER.

VERMOREL POWER DUSTING OUTFIT

For Dusting Rubber, Citrus, etc. With this outfit a height of up to 100-ft. from the ground can be dusted effectively.

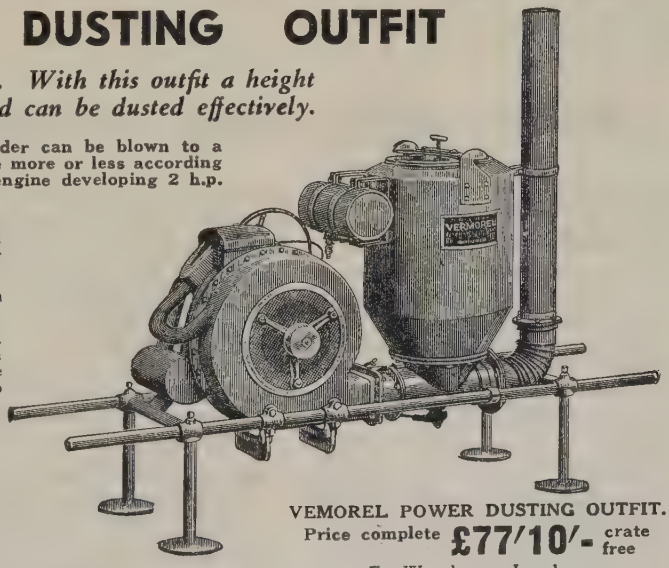
This outfit, by means of which a cloud of powder can be blown to a height of 100-ft. from the ground (this height may be more or less according to astmospheric conditions), consists of a 2-stroke engine developing 2 h.p. at 2,000 revolutions.

The powder container (which holds 30 lbs.) has a large dust-tight filling opening, is fitted with a feed regulator, by means of which the output of powder can be controlled accurately.

An agitator in the powder container ensures an even supply of powder to the outlet.

The whole forms a compact unit clamped to a tubular iron frame in the form of a stretcher with four legs. Handles are provided for carrying, or the machine can be slung from the four corners on two poles carried on the shoulders of the workmen.

The complete outfit weighs under 2-cwt.



ALL TYPES OF WET AND DRY SPRAYERS MADE AND STOCKED.

2¼ pints to 220 gals. Prices from 4/9 to £202 10s.

VEMOREL POWER DUSTING OUTFIT.
Price complete £77/10/- crate free
Ex Warehouse London

Compelte Catalogue and List of Stockists in New Zealand from:

COOPER, PEGLER & CO., LTD. 29e Clifton St., London, E.C.2

must always be taken not to injure the tree trunk.

Collar-rot is associated with *Fusarium limonis* and differs from bark-blotch in that cankers which gum copiously appear on the stem or crown of the tree (bud-union), and the bark is discoloured and emits a disagreeable odour. The treatment is similar to that for bark-blotch, but the crowns of affected trees should be exposed and drainage improved in the orchard. Collar-rot occurs most frequently on wet, poorly-drained soils, and is most liable to attack trees deeply planted where the bud-union is near ground level.

Brown-rot (*Phytopthora citropthora*) can cause very severe losses in citrus orchards, resulting in the leaves turning brown and wilted and the fruits becoming greyish-brown, decayed, and emitting a pungent smell. Although a Bordeaux 3-4-50 in the autumn is essential, control also requires the trees to be pruned three feet from the ground and the area under the tree sown in a cover crop. The reason for this is that brown-rot is a soil fungus which thrives in the presence of moisture, and unless the trees are kept clear of the ground the spores are splashed from the soil on to the foliage.

Sclerotinia sclerotiorum is not often seen in the orchard, but appears as a wilting and softening of the laterals, and the affected tissues appear whitish. Prune off and burn affected tissues.

Citrus-borer (*Aemona hirta*) is very common in neglected trees. The twigs and laterals die through the citrus-borer larvae boring down the living wood. The holes in the tree and sawdust borings are the characteristic effects of this insect, which is a native beetle which lays its eggs in the crevices of dead bark or on rough-cut surfaces. About this time of the year the larva may be seen as a white grub if these dead twigs are split open. All infected young twigs should be pruned off and burnt, and in older limbs inject benzine into the holes and plug with approved crude oil jelly.

Dicky - rice - weevil (*Maleuterpes spinipes*) has become troublesome in certain districts, chiefly because the fruits have become unsightly through the weevil chewing the rind in the form of a network of furrows, which cause discoloration. The eggs of this insect are laid in the soil, and the larvae feed on the roots. The adult weevil is a small, greyish-brown insect, which has never been known to fly. Advantage is taken of this fact to prevent the insect gaining access to the tree. Trees should be pruned one foot off the ground, and then tree bands applied to the trunks below the fork or to each limb if the tree branches near ground level. The tree banding material, unfortunately, does not trap the insect, but merely prevents it reaching the fruit and foliage, and should be kept fresh by the addition of further material when required or by rubbing the material with a stick.

Citrus-canker (*Pseudomonas citri*) is a bacterial disease, and unless it is detected early and remedial measures are taken, it may cause severe losses. The most readily observed characteristics are yellowish-brown lesions or raised spots with a crater-like appearance in the centre. These spots are visible on both leaf surfaces, but are most noticeable on the under surface. Each spot on the under surface should have a corresponding spot on the upper surface. If such symptoms are observed, immediate steps should be taken to notify the local Orchard Inspector before any remedial action is taken, as it is essential that a correct diagnosis be obtained.

Citrus-blast (*Pseudomonas syringae*) is another bacterial disease, but is of only minor importance compared with citrus-canker. It is most active in late winter and early spring in exposed orchards. Infection follows injury by thorns, hail, frost, etc. Its appearance on the fruit, which is the most readily recognised symptom, consists of firm deep black circular pits with upright walls.

Reference to physiological diseases will be made in next month's notes.

Now is the time for getting the orchard clean before the onset of summer. Budding can be undertaken, and do not forget the 3-4-50 Bordeaux spray to prevent *verrucosis* on young developing lemons.

—A. W. M. GREIG, Citriculturist, Auckland.

Viticulture

Grape Anthracnose, or Black-spot of the Vine

(*Continued from the October issue.*)

Control of Black-spot

Fortunately, black-spot is of a fairly slow spreading nature compared with other vine fungi, such as powdery mildew and downy mildew, and is therefore rather easier to treat and confine to certain areas.

Because of its over wintering habits it is more amenable to winter treatment. It is evident that the destruction of all hibernating forms will remove the cause of infection and prevent fresh outbreaks. Therefore, where black-spot has caused considerable trouble, winter treatment is definitely essential, hence the efficiency of the winter swab or spray.

Prevention is better than cure, and authorities agree on the superiority of preventative winter treatment over the summer or curative applications made while the vine is in growth. Spring or summer treatment is supplementary to the winter treatment, and in order to combat the disease the treatment must be twofold, and should consist of:—

(1) The winter swab or spray to destroy as far as possible the hibernating form of the fungus.

(2) The spring and summer treatment with copper sulphate (bluestone) mixtures to prevent the spread of the disease, which would develop from any of the wintering forms which have escaped destruction by the swabbing or spraying in the dormant period.

The Winter Swab

Both concentrated iron sulphate solution and 10 per cent. sulphuric acid are effectual destroyers of black spot in the dormant season. Both, however, have considerable disadvantages on their own, and a compromise by a combination of the two has been proved to be the most reliable.

The standard winter treatment for black spot consists of a thorough swabbing or spraying of the vines with a mixture of sulphuric acid and sulphate of iron. The treatment is as follows:—

(1) After pruning, all cuttings should be collected and burnt.

(2) If time and labour permit, the vines may have the loose old bark removed and burnt. To leave it on the ground is worse than useless.

(3) Thorough swabbing or spraying with the solution.

A reliable formula is as follows:
Sulphate of iron ..... 20 lb.
Sulphuric acid ..... 8 lb.
Water ..... 10 gallons.

Preparation of Solution

There are several methods of making the sulphate of iron-sulphuric acid solution, of which the following are the two most satisfactory methods:—

(1) Place the iron sulphate crystals in a wooden, earthenware or lead vessel, pour the sulphuric acid over them, add the water (preferably hot) and stir until dissolved.

(2) Dissolve the sulphate of iron by suspending it overnight in a piece of hessian in the water. In the morning add the acid slowly.

Care should be taken when making up the solution, as the contact of the acid and water causes considerable spurting, and unless care is taken and the liquids poured slowly the operator is liable to receive acid burns about the body. Being very corrosive, the solution must not be placed in any vessels made of any other metal but lead; it can be conveniently handled in wooden vessels.

Spraying in the Dormant Season

If the disease has been particularly bad in the previous season two applications are desirable. When only one swabbing is given it should take place as near the bursting of the buds in spring as possible. Unfortunately, the date cannot be forecast correctly, as the seasons vary greatly from one year to another, and even vary considerably in different districts in the same year.

It is important not to leave the application so late that injury may be done to the bursting buds. When two applications are decided on the first should be given a month to five weeks before bud-burst, and should be followed by the second application as near to bud-burst as possible. One effect of the swab is to retard bud-burst, and in districts liable to late frost this is a distinct advantage.

The appearance of the vines after treatment is curious, and to inexperienced growers somewhat alarming, as they are blackened and discoloured. No damage, however, need be feared, provided the buds have not begun to move at the time of application.

Complete coverage is most important, both with the winter and the spring and summer treatments.

The leaves and canes of a vine infected with black-spot.

Methods of Applying The Swab

For convenience the term "swab" is used for the winter treatment, although this can be and very often is applied by spray pump. Swabbing is usually applied by means of a brush. Because of the corrosive action of the solution, the brush selected must not have any metal in the binding, and brushes are procurable which are bound with string instead of wire.

The method of applying the swab is of less importance than the thoroughness with which it is done. Every single portion of the vine must be well soaked; the old wood of the stems are just as important as the new rods or spurs. When swabbing by brush, the brush must be moved from the nose of the rods towards the ends so as to avoid breaking off the buds.

If spraying is decided on, it is necessary to use special lead-lined knapsacks, and nozzles must be made of lead or ebonite to withstand the corrosive action. If there is considerable acreage to cover and it is decided to spray, special spray outfits with capacities of up to 70 gallons and fitted with non-corrosive pumps and fittings are procurable.

The spraying is cheaper and of more rapid application than the swab, although it is not considered to be as thorough. There is also considerable wastage of liquid when spraying.

The quantity required to swab an acre of trellised vines is approximately 20 gallons using the swab, and 25 to 30 gallons if sprayed on.

A late winter control measure which has proved effective in the Australian Commonwealth consists of a double strength of Bordeaux mixture applied just as the buds are bursting. This spray can be made from 5 lb. bluestone, 5 lb. high-quality hydrated lime, and 10 gallons of water.

A winter control measure (recommended by the Plant Diseases Division, Department of Scientific and Industrial Research) consists of a spray with concentrated lime-sulphur mixtures to destroy, as far as possible, the hibernating form of the fungus. This lime-sulphur spray should be applied at the rate of 1-15 together with a reliable wetting agent to act as a penetrator.

Spring and Summer Treatment

Although winter treatment can be very effective, further spraying is necessary during the growing season, particularly if the season is at all wet. Because of the ability of black-spot to develop at low temperatures, the treatment must be started as soon after bud-burst as possible in order to coat the plant tissues with a protective film of copper spray solution.

Make an application of Bordeaux mixture just after the first bud-burst at a strength of 5-4-50, and again when the later buds are bursting apply at summer strength of 3-4-50. If weather conditions favour the disease, spray again before blossoming and again as soon as the fruit has set. Later applications are governed by weather conditions.

The summer spraying control of black-spot is equally effective in the control of downy mildew, and although downy mildew generally appears later in the season, it can be safely counted on as controlling two diseases with the one spray.

Instructions on how to make Bordeaux mixture were published in the Orchard Notes in the September issue of the "Journal."

—B. W. LINDEMAN, Vine and Wine Instructor, Auckland.

Cool Storage Notes

Stacking the Fruit

WHEN being stacked in cool storage chambers, fruit should be made accessible for constant inspection to enable deterioration to be detected in time to save repacking and loss. The lay-out should provide for ample passage-ways and the method of stacking the fruit should make inspection of the stacks possible without undue inconvenience or increase in the cost of handling.

(Continued on page 384.)

Citrus Canker Regulations, 1940

THE purpose of the Citrus Canker Regulations is to confer all necessary powers to eradicate or effectively control the spread of citrus canker of Japan in certain citrous orchards in the Tauranga and Keri Keri citrous growing districts.

Declaration of Infected Areas

Accordingly, under Parts 2 and 4 of the regulations an inspector has authority to declare any land planted with citrous trees which are affected by or infected with the disease to be an infected area into or from which no citrous trees, tools, implements, appliances, etc., shall be brought or removed without the written consent of an inspector, and subject to such conditions as he thinks fit to impose. Portions of citrous trees may, however, be removed from an infected area by an inspector for the purpose of identification of disease.

Control Measures

Occupiers of land planted with diseased trees may be required to barepole, destroy, disinfect or otherwise treat such trees in accordance with the directions of an inspector, and may be similarly required to disinfect or treat all infected tools, implements and appliances which have come into contact with diseased trees. They may also be required to take such remedial or precautionary steps as an inspector may direct to render and preserve the land thoroughly free from disease and infection. Alternatively, an inspector may himself take action to barepole or destroy diseased trees.

Outbreaks to be Reported

Occupiers of land who suspect that the disease exists among citrous trees on their land must promptly report the matter to the nearest Orchard Instructor or to the Director of the Horticulture Division of the Department at Wellington.

Advisory Committees

Citrus Canker Advisory Committees may be set up for defined citrus-growing districts. Each committee shall consist of two officers of the Department of Agriculture, one officer of the Plant Diseases Division of the Scientific and Industrial Research Department, the President of the Citrus Growers' Association for the citrus-growing district, and one other citrus-grower. The general functions of a committee are to advise the Minister of Agriculture with respect to any matter relating to the eradication or prevention of citrus canker.

Compensation

All persons having any estate or interest in land on which citrous trees have been barepoled or destroyed after May 31 last or are barepoled or destroyed after the coming into force of the regulations are entitled to compensation for such barepoling or destruction, the proportion payable to each being such as may be mutually agreed upon between them. In default of agreement the compensation may, in the discretion of the Minister, be paid to the owner, occupier or mortgagee upon his furnishing an indemnity with two sureties approved by the Minister indemnifying the Crown against all claims and demands made by any other person having any estate or interest in the land in respect of which a claim for compensation arises.

Method of Assessment

For the purpose of determining the amount of compensation payable under the regulations, the value representing the loss resulting from barepoling or destruction of a citrous tree is to be assessed by the Advisory Committee for the district in which the land of the grower is situated. In the case of the barepoling or destruction of citrous trees which have not come into bearing at the date of barepoling or destruction, their value for compensation purposes must not be less than 2s nor more than 7s 6d per tree. In the case of citrous trees which have come into bearing at the date of barepoling or destruction, their value for compensation purposes shall be based on the value of the loss of crop computed at 7½d per quarter loose bushel estimated by the committee to be the quantity of fruit that would have been harvested therefrom during the three annual harvests next following the date of barepoling or destruction, with a minimum value of 7s 6d and a maximum value of £3 per tree. In assigning values for the purposes of compensation the committee shall act on the personal knowledge of its members and any information in the possession of members of the committee without taking evidence or hearing parties.

Amount of Compensation

The compensation payable under the regulations shall be the value assessed by the appropriate committee reduced as follows:—

(a) By 75 per cent. in the case of orchards containing not more than 10 citrous trees.

(b) By 25 per cent. in the case of orchards containing more than 10 but not more than 50 citrous trees.

(c) By 12½ per cent. in the case of orchards containing more than 50 citrous trees.

(d) By 12½ per cent. for trees barepoled or destroyed in a nursery.

No compensation shall be payable for the destruction or barepoling of citrous trees in a domestic or backyard orchard, nor shall compensation be payable if an inspector is obstructed in carrying out the provisions of the regulations for the purpose of eradicating disease on any land. Compensation is payable only after the measures ordered by an inspector have been carried out to his satisfaction.

Payment

In the case of destruction of citrous trees the whole of the compensation payable shall be paid as soon as practicable after such destruction. Where citrous trees have been barepoled, 40 per cent. of the compensation payable shall be paid as soon as practicable after the barepoling has been completed, while 20 per cent. of the compensation shall be paid at twelve-monthly intervals in each of the three years following barepoling. If a grower, some of whose citrous trees have been barepoled or destroyed, fails to tend the remaining trees according to proper orchard management and practice and an inspector is of the opinion that further outbreaks of disease will occur among the remaining trees, the inspector may order the destruction of the remaining trees or such number as he deems necessary or advisable. In such case no compensation shall be payable for such destruction, nor shall any person be entitled to payment of any compensation moneys that may be outstanding and unpaid for the barepoling of trees prior to such destruction. If, apart from the neglect or default of the grower, a barepoled citrous tree is subsequently ordered to be destroyed, the balance of the compensation moneys payable for the barepoling of that tree shall be paid as soon as practicable after such destruction.

Copies of the regulations may be obtained on application to the Government Printer, Wellington.

—A. E. MORRISON, Solicitor, Department of Agriculture.

Recognition and Control of Citrus Diseases in New Zealand

By A. M. W. GREIG, Citriculturist, Department of Agriculture, in collaboration with officers of the Plant Diseases Division, Department of Scientific and Industrial Research.

Based on Citrus Pests "N.Z. Journal of Agriculture," "Fungous Diseases of Fruit Trees," etc.

FUNGOUS DISEASES:

SYMPTOMS: Leaves.	SYMPTOMS: Stem.	SYMPTOMS: Fruit.	Disease.	Control.	Remarks and References.
Yellowed and premature fall.	Bark dead and flaking, practically no gumming.		**Bark-blotch.** Ascochyta corticola	Remove sources of infection and burn affected material. With a sharp knife, clean off affected tissue, paint with Bordeaux paste or acidulated mercuric chloride 11-1,000 and a bitumastic paint.	Fungous disease of lemon, probably gains entry through injury. **Fungous Diseases of Fruit trees,** pp. 319-323, 1925.
Leaves brown and wilted.	Small dead areas on laterals.	Fruits greyish brown & decayed. Pungent smell	**Brown-rot** Phytophthora citrophthora	Spray as indicated in general programme. Prune trees 3 ft. from the ground and stir soil continuously, or preferably sow a cover crop in the autumn, to prevent spores being splashed on to tree.	Fungous disease of lemon or orange. A soil fungus which can only thrive in the presence of moisture. **Fungous Diseases of Fruit trees,** pp. 323-326, 1925.
Leaves yellowed.	Cankers on stem or crown. Copious gumming. Bark discoloured and disagreeable odour.		**Collar-rot** Associated with Fusarium limonis	Early detection and remedial treatment essential, but cut out all infected tissues—paint with acidulated mercuric chloride and apply a bitumastic paint. Improve the drainage and expose the crowns of affected trees.	Fungus associated with disease of lemon or orange. Wet, poorly drained soils and deep planting favour onset of collar rot. **Fungous Diseases of Fruit trees,** pp. 329-331, 1925.
		Pallid grey, slightly polished area, later traversed by fissures — aerolate markings	**Grey-scab** Gleosporium limetticolum	Spray as indicated in general programme.	Fungous disease of lemon and orange. Lowers market value of fruit, otherwise little effect on host. **Fungous Diseases of Fruit trees,** pp. 332-334, 1925.
		Raised superficial markings—brown dots, lines, curves and irregular shaped spots; also causes stem-end rot in storage.	**Melanose** Phomopsis citri	Remove all weak and dead shoots, and spray as indicated in general programme.	Fungous disease carried over on infected leaves, twigs and branches, and in moist humid weather spores ooze out and are transmitted to leaves and fruits. Insects, wind and rain are thought to be the most important factors in distribution of spores.

SYMPTOMS:			Disease.	Control.	Remarks and References.
Leaves.	Stem.	Fruit.			
	Wilting and softening of laterals. Affected tissue whitish in appearance.		**Sclerotinia** Sclerotinina sclerotiorum	Prune off and burn all affected tissues.	Cottony rot. Attacks lemon laterals injured by frost.
Thin, black or greyish film over leaves	Over stems	and over fruits.	**Sooty-mould** Capnodium citricolum	Spray as indicated in general programme to control the scale insects and the fungus will disappear, as it is entirely a secondary condition.	Fungus due entirely to presence of black scale, cottony cushion or white wax scales. The fungus lives on the "honey dew" excreted by these insects. **Fungous Diseases of Fruit trees,** pp. 336-339, 1925.
Distorted and often raised pinnacles.		Distorted with yellow or light brown warts.	**Verrucosis** Sporotrichum citri	Spray as indicated in general programme.	Fungus hibernates in infected leaves and young fruits. Mature leaves and fruits immune. Abundant moisture necessary. **Fungous Diseases of Fruit trees,** pp. 326-329, 1925.
Irregular dead spots.	Die back.	Premature shedding. Brown depressed spots on fruit.	**Wither-tip** Glomerella cingulata	Remove dead and weak growth, and burn. Spray as indicated in general programme.	Fungus attacking unthrifty trees, grows from tips. Overwinters on dead wood. Attacks lemon, sweet orange and N.Z. grapefruit. **Fungous Diseases of Fruit trees,** pp. 340-344, 1925.

INSECT PESTS.

Infests foliage, curls young leaves.	Infests young twigs.		**Black-aphis** Aphis tavaresi	Spray as indicated in general programme.	Sucking insect seen during summer months. Vivaparous winged and wingless forms, characterised by projecting tail piece and two "honey tubes." **N.Z. Jour. Agr.,** Vol. 57, pp. 332-333.
	Twigs die through larvae boring down in living wood. Sawdust borings.		**Citrus-borer** Aemona hirta	Prune off and burn young twigs. In older limbs, inject benzine and plug with petroleum jelly.	A native beetle—lays eggs in the crevices of dead bark or on rough cut surfaces. Dec. young tips of twigs die off—white grub within. Spring and early summer reddish brown beetle 1in. long. **N.Z. Jour Agr.,** Vol. 57, pp. 28-29.
Pieces eaten out.		Rind chewed in form of net-work furrows which discolour.	**Dicky-rice-weevil** Maleuterpes spinipes	Ostico tree bands applied to trunks of trees below fork or on each limb. Prune all branches 1ft. off the ground.	Eggs laid in soil—larvae feed on roots. Adult weevil greyish brown, weevils never known to fly. **N.Z. Jour. Agr.,** Vol. 56, pp. 345-346.

SYMPTOMS: Leaves.	SYMPTOMS: Stem.	SYMPTOMS: Fruit.	Disease.	Control.	Remarks and References.
	Cuts on young stems of citrus trees.		**Cicada**		Injury generally only of importance in that possible for fungus to enter. Due to cicada egg-laying apparatus. **N.Z. Jour. Agr.**, Vol. 59, pp. 47-48.
Two or more leaves fastened together by silky thread; pieces eaten out of leaves.		Leaf attached to fruit by silky thread. Caterpillar chews or burrows into rind. Premature dropping of fruit.	**Leaf-roller-caterpillar** Tortricid moth spp.	Spray as indicated in general programme.	A moth, the larvae of which cause loss of fruit. **N.Z. Jour. Agr.**, Vol. 59, p. 47.
Young leaves infested.		Stylar end of lemons attacked.	**Mealybug** Pseudococcus adonidum (long-tailed) Pseudococcus maritimus (Short-tailed)	Spray as indicated in general programme.	White, mealy in appearance—oval in shape, ornamented with white filaments—produce "honey dew" on which *Capnodium citricolum* grows. **N.Z. Jour. Agr.**, Vol. 57, pp. 332-333.
Infests leaves. Colonies on under side of leaves, yellowed appearance.		Sometimes infests fruit.	**Red-mite** Paratetranychus citri	Spray as indicated in general programme.	Dry season infection shows up at Christmas. Very minute, sucking insect, dispersed by wind: usually destroyed by rain or unfavourable climatic conditions. **N.Z. Jour. Agr.**, Vol. 57, pp. 138-139.
Silvery appearance on leaves	stem	and fruit.	**Thrips** Heliothrips haemorrhoidalis	Spray as indicated in general programme.	Rasping and scarring by thrips. This is a narrow black insect with 2 pairs of whitish wings. Eggs laid in plant tissues. Insects prefer shaded situations. Not common "blossom thrips.' **N.Z. Jour. Agr.**, Vol. 57, pp. 138-'39.
Sooty mould not generally present on leaves	stem	or fruit.	**Circular-black-scale** Chrysomphalus rossi (Shielded scale)	Spray as indicated in general programme.	Circular black flat scale with a central raised "boss" of light brownish grey colour. Many other hosts include Eleagnus and Camellia. **N.Z. Jour. Agr.**, Vol. 57, pp. 429-432.
Infests leaves. Sooty mould may be present, but not characteristic.	Infests very young twigs.		**Hemispherical scale** Saissetia coffeae (unshielded scale)	Spray as indicated in general programme.	Brown to reddish brown in colour, highly convex and of a shining smoothness. H marking on immature forms only. Many other hosts include palms, japonica, camellia, asparagus and currant. **N.Z. Jour. Agr.**, Vol. 58, pp. 145-146.

SYMPTOMS:			Disease.	Control.	Remarks and References.
Leaves.	Stem.	Fruit.			
Infests leaves, especially midribs. Sooty mould present.	Infests more woody parts, twigs and small branches. Sooty mould present.		**Olive-scale** Saissetia oleae (Unshielded scale)	Spray as indicated in general programme.	Adult very dark brown, younger brown. Characterised by raised H-shaped marking. Many other hosts include rose, guava, pear, palm, apple, plum, grapevine, wisteria, pepper tree, holly, laurel and camellia. **N.Z. Jour. Agr.**, Vol. 58, pp. 145-146.
Infests foliage. No "honeydew."	Infests twigs	Infests fruit, lemons more than oranges.	**Red-scale** Aonidiella aurantii (Shielded scale)	Spray as indicated in general programme.	Yellowish to reddish brown in colour. Viviparous. Prefers position exposed to sunshine. Thrives on sickly trees and prefers hardened growth. **N.Z. Jour. Agr.**, Vol. 57, pp. 429-432.
Young scales on upper surface of leaves. Sooty mould present.	Adults on stems and small branches. Sooty mould present.		**Hard-wax scale** Ceroplastes sinensis (Unshielded scale)	Spray as indicated in general programme.	Adult white tinged with grey, with one dark spot at apex and six round the periphery. Young star-shaped. Hosts include puriri, tree tomato. **N.Z. Jour. Agr.**, Vol. 58, pp. 421-422.
Young scales on upper surface of leaves. Sooty mould present.	Adults on stems and small branches. Sooty mould present.		**Soft-wax scale** Ceroplastes destructor (Unshielded scale)	Spray as indicated in general programme.	Adult almost pure white, globular in shape with 2 flatter white marks at one end. Young star-shaped.
Young larvae on mid ribs of leaves. Sooty mould present.	Feeds on twigs and branches. Sooty mould present.		**Cottony-cushion-scale** Icerya purchasi (Unshielded scale)	Spray as indicated in general programme.	Oval in outline, reddish brown in colour and covered with a yellowish mealy material. Pure white corrugated ovisac is characteristic of this insect. Hosts include acacia, gorse, wattle, roses, dahlia, grapevine, chrysanthemum, tung oil and pear. Checked by ladybird **Rodolia cardinalis.** **N.Z. Jour. Agr.**, Vol. 58, pp. 421-422.

BACTERIAL AND PHYSIOLOGICAL.

Blackening of petioles and basal portions of leaves.	Blackening of twigs, small scabs, reddish brown in colour.	Black pitting, firm deep circular pits with upright walls.	**Citrus-blast** Pseudomonas syringae	Adequate shelter. Removal and burning of infected material. Spray as indicated in general programme. Harden off autumn growth before winter.	Bacterial disease—most active in late winter and early spring in exposed orchards. Infection follows injury by thorns, hail, frost, etc. Lemons more affected than oranges. **N.Z. Jour. Sci. & Tech.**, Vol. 20, pp. 50A-54A, 1938.

SYMPTOMS:			Disease.	Remarks and References.	Control.
Leaves.	Stem.	Fruit.			
Yellowish brown lesions with crater-like appearance. Seen more readily on under side of leaves.	Light brown eruptions — not seen as readily as leaf infection.	Separate, distinct, darker brown eruptions, generally scabby with cracks —less obvious than on foliage.	**Citrus-canker** Pseudomonas citri	Severe infection eradication. Light infection complete "barepoling." Remove all tissues less than 3 years old and burn. Paint wounds with bitumastic paint. Spray with lime sulphur at a concentration of 0.2% W/W polysulphide (1-75 when polysulphide content of concentrate is 15%). Disinfect pruning implements in boiling water, hands in 1-5,000 acidulated mercuric chloride.	Bacterial disease—infects lemon, Marsh's grapefruit, sweet orange and to a limited extent N.Z. grapefruit. **N.Z. Jour. Sci. & Tech.**, Vol. 20, pp. 55A-62A, 1939.
Foliage wilts, turns brown and drops. Light frosts may form gum spot.	Twigs wilt and later turn blacfl.	Externally fruits may appear perfect, but cut dry. Severe cases fruits turn light brown and then black.	**Frost-injury** Physiological	Remove all tendency to frost pockets by cutting gaps in shelter at lowest point. If warranted, instal fire pots.	Lemons most susceptible, oranges less and N.Z. grapefruit least.
Leaves lacerated and knocked off trees.		Slight hail results in oil spot. More severe hail results in brown pits with cracks radiating from the central point.	**Hail-injury** Physiological	No control.	Hail storms.
Reddish brown scabbed area under surface of leaves.	Darker brown on N.Z. grapefruit twigs.		**Sun-scald** Physiological	No control.	Due to sunburn. Most frequently seen on N.Z. grapefruit and American grapefruit, mandarin and sweet orange.
Small raised pustules, dark brown to purplish brown in colour, smooth and hard.			**Gum-spot** Physiological	No control.	Due to frost followed by bright sunshine, sunburn, spray injury and lack or excess of chemical elements.
		Oil liberated. Green oil spot and brown oil spot. Slight sinking of tissues between oil glands of the rind.	**Oil-spot** Oleocellosis Physiological	Avoid picking dark green lemons when wet and all bumping likely to cause surface abrasions.	Oil liberated and acting on the tissues for a short period. Also caused to some extent by slight hail injury. Occurs chiefly on lemons.

PROGRAMME A: LEMONS

PERIOD OF APPLICATION.	SPRAY.	PURPOSE.
Pre-blossom of main crop., i.e., October.	Bordeaux 3-4-50.	Verrucosis, Melanose, Grey-scab. Wither-tip.
Petal-fall of main crop, i.e., late November.	Bordeaux 3-4-50. Acid lead arsenate 1½lb.—100 gals.	Verrucosis, Melanose, Grey-scab. Wither-tip. Leaf-roller.
Late December	Bordeaux 3-4-50.	Verrucosis, Melanose, Grey-scab. Wither-tip.
Mid-February	Summer oil 3 per cent. Nicotine sulphate 1-800.	Red-scale and other scales. Thrips, Black-aphis, Red-mite, Mealy-bug.
3-4 weeks later	Summer oil 3 per cent.	Red-scale and other scales.
Petal-fall of autumn crop, i.e., early May	Bordeaux 3-4-50.	Verrucosis, Melanose, Grey-scab. Wither-tip, Brown-rot, Citrus-blast.

PROGRAMME B: ORANGES

PERIOD OF APPLICATION.	SPRAY.	PURPOSE.
Petal-fall, i.e., November	Bordeaux 3-4-50. Acid lead arsenate 1½ lb.-100 gals.	Melanose, Grey-scab, Wither-tip. Leaf-roller.
Early January	Acid lead arsenate 1½ lb.-100 gals.	Leaf-roller.
Mid-February	Summer oil 3 per cent. Nicotine sulphate 1-800.	Red-scale and other scales. Thrips, Red-mite, Black-aphis, Mealy-bug.
3-4 weeks later	Summer oil 3 per cent.	Red-scale and other scales.
Early May	Bordeaux 3-4-50.	Brown-rot, Wither-tip, Citrus-blast.

Additional sprays where required:—

(1) For thrips, nicotine sulphate 1-800 plus 1 per cent. summer oil.

(2) For aphis, nicotine sulphate 1-800 plus soft soap 4lb.—100 gallons. **Note:** Soft soap must not be used in combination with lead-arsenate or bordeaux mixture.

Remarks:

Reference to the original papers dealing with insect and fungous diseases of citrus will show that certain recommendations are at variance with the above programmes. In practice, however, it is impossible to deal with individual diseases, and consequently these programmes have been designed as routine treatments to control the major fungous and insect pests. At the same time, the less important diseases will be adequately controlled.

In seasons where infestation of red-scale is slight the second summer oil may be omitted. It is recommended that any variation from the above programmes should be adopted only on the advice of the Orchard Instructor.

The Home Garden

Vegetables, Small Fruits and Flowers

Outdoor Tomato Culture

THERE are few vegetables more in demand or more extensively grown than tomatoes. Apart from diseases and pests to which most fruit-producing plants are liable it is doubtful whether any country can produce better quality or more abundant yields than New Zealand when proper attention is given to their cultural requirements. While tomatoes are usually vigorous-growing plants and will produce a fair crop of fruit in almost any circumstances, there is no crop that will more amply repay good care and attention.

Soils and Manures

Almost any reasonably good soil will grow tomatoes provided the site is well sheltered and free from late frosts, but a good, rich, friable, light clay loam or sandy loam is the most suitable. Good drainage is also essential.

As tomatoes are heavy feeders, great care should be exercised in the manurial treatment. Excessive dressings of nitrogenous manures should be avoided as they are very forcing in their effect and liable to produce an abundance of succulent leaf growth at the expense of a satisfactory crop of fruit. Phosphates stimulate root development and enable the plant to make a balanced growth, and also have the effect of producing early maturity.

The manures generally used, which give satisfactory results, are blood and bone, superphosphate and potash in the proportion of 2-2-1, applied as a base dressing at the rate of 8 to 10 cwt. per acre. This manure should be distributed by hand in the furrows marked out to take the plants and later worked into the soil by the means of a cultivator. This procedure avoids any risk of the fertiliser being so concentrated that it will injure or destroy the plant roots, but at the same time places it in a position so that it is readily available for the plants.

The value of humus to the soil should not be overlooked, as it is highly essential, especially for the lighter types of soil. A rotation of green cover crops should be grown and ploughed under during the winter months.

Varieties

Preferences for varieties vary to some extent in the different districts, but those most commonly grown are Australian Dwarf, Australian Large Red, Dreadnought, Blakeley, Kondine, Kidson, Adelaide Dwarf, and Sutton's Best of All.

Seed

Special attention should be given to the selection of seed, as nothing is more essential to the securing of a good tomato crop. In purchasing, always buy the best available. Where possible, it is advisable for growers to save their own seed, especially if in possession of a good strain. For this purpose, selection of fruit of the best type should be made from the healthiest and most prolific plants. Allow the fruit to become fully ripened on the vine. When gathered, cut the fruit in halves and squeeze the pulp into a container. This should be allowed to remain until properly fermented, which usually takes from four to five days (vigorous stirring facilitates separation of seed from pulp). Then skim off all floating seed and fermented pulp. The remaining portion should then receive several successive washings with water, which will clean the seed thoroughly, after which it can be removed, spread in thin layers, and placed in the sun to dry as quickly as possible.

Raising the Plants

Several methods are adopted in raising tomato seedlings. In districts which have a warm climate the usual practice is to sow the seeds in specially prepared beds under glass frames, and in districts where frosts are more severe the seeds are sown in boxes which are placed on a hot-bed in a glasshouse. As tomato seedlings are subject to "damping-off," which is due to soil fungi, it is essential that the soil used for raising the seedlings should be thoroughly sterilised. This can either be done by steam or by treating the soil with diluted formalin. If the latter is used, one pint of formalin should be mixed with seven gallons of water and the soil thoroughly watered with the solution. The treated soil should then be covered with sacks moistened with the solution

Seasonal Don'ts

Don't

forget to pay special attention to the crops which are in season from April to October. It is important to get them established before summer droughts occur. During December sowings of swedes and parsnips may be made. It is a busy month for transplanting seedlings of crops sown in October. Among these are borecole, broccoli, cabbage (savoy and winter varieties), celery, celeriac, leeks and silver beet.

Don't

lose your cruciferous crops (cabbage family) through the attacks of white butterfly or the diamond-backed moth. Derris dust very effectively destroys the grubs of these pests. As prevention is better than cure, it is advisable to apply the dust before the young plants are seen to be attacked, and to repeat the application at frequent intervals, so that while the egg-laying insects are hovering about the plants will be coated with the dust. The dust is quite harmless to animals and humans. Its thorough and efficient use will assure a winter supply of these valuable crops. Every gardener should possess a small blower. The few shillings cost is well spent.

What To Do In The Garden Next Month

Summary of Operations During December

VEGETABLE SECTION.

SUCCESSIONAL SOWINGS

Beans, corn, lettuce (grow without transplanting), peas (main crop varieties till middle of December, then delay further sowing till advised), radish, spring onions (keep well moistened), turnips.

OTHER SOWINGS.

Carrots (shorthorn varieties if not sown last month), swedes (if not sown last month), parsnips (for use in late winter).

SEEDLINGS TO TRANSPLANT.

Broccoli, Brussels sprouts, cabbage (Savoy, winter and red), cauliflower, celery, celeriac, late crop of tomatoes (sown October).

PERENNIAL CROPS.

Rhubarb.—The harvesting should be discontinued during December and the beds cultivated and dressed with farm and artificial manure so that reserves, from which production will be obtained next spring, may be accumulated in the roots.

SPECIAL NOTES FOR COLD DISTRICTS.

Sow spring cabbages about the end of the month (in other districts during February).

CROPS IN SEASON.

(The month in brackets represents the month of sowing the seed).
Salads.—Lettuce (Sept.), radish (Nov.), spring onions (Sept.), tomatoes (glasshouse).
Greens.—Marrows (Aug. in warm districts), beans (Oct.), peas (Aug. sown Alderman), spring cabbage (Aug.-Sept.), cauliflower (Mar.-Apr.), red cabbage (Feb.), broad beans (Aug.).
Roots.—Beetroot (Sept. globes), carrots (Aug.-Sept. shorthorns), parsnip (Aug. Oxheart), early onions (Mar. and July-Aug.), shallots (July), potato onions (May), new potatoes (Aug.), turnips (Oct.).

CROPS IN STORE.

Kumaras, onions (long keeping), potatoes and shallots.
Note: These crops will be in good condition only if they are well stored.

GENERAL WORK.

Tie up tomatoes and remove side shoots.
Use the hoe frequently to destroy weeds and to conserve moisture.
Apply liquid manure to salad crops.
Thin out seedlings.
Spray to prevent disease and use derris dust to control white butterfly larvae.
Earth up potatoes and other crops. Kumaras should receive this treatment before they begin to run. Apply water as required.

SMALL FRUITS SECTION.

When possible, keep the ground cultivated.

FLOWER SECTION.

Complete the planting of gladioli.
Plant out dahlias and chrysanthemums.
Take tip cuttings of hydrangeas and set them in sandy loam to strike.
Lift narcissi and other bulbs as the foliage yellows and will break away from the bulbs without difficulty. Narcissi bulbs should be replanted promptly, but some other bulbs, notably hyacinths and irises, are better dried off completely. Tulips and narcissi, which sunscald readily, should not be exposed to the sun.

GLASSHOUSE SECTION.

Harvesting the glasshouse tomato crop is now in full swing. The house should be freely ventilated to remove the moisture-laden air.
No further lateralising or stopping of the plants should be attempted. They now require as much leaf as possible, and this especially where tomato leaf mould (*Cladosporium fulvum*) is present.

---

for 24 hours, and then left to stand for about three weeks before sowing the seed, stirring it occasionally to liberate the gas.

In sowing, the seeds should be scattered on the surface of the soil, covered lightly with a fine sand, and then gently firmed by light pressure with a flat board. When the seedlings have developed the first pair of true leaves they should be pricked off into boxes or beds, allowing enough space between the plants for their development. As the plants approach the planting out period they should be gradually hardened off. This can be assisted by withholding water for a week or ten days before removal from the boxes or beds. As a result, the plants will become tougher and better able to withstand the shock of transplanting.

Transplanting

The day before transplanting in the field, the beds or boxes should be given a good watering to facilitate the removal of the plants without unduly damaging the roots. The time of planting tomatoes in the field varies according to climatic conditions, and is not usually undertaken until the danger of late frosts and cold weather is past.

There are many different opinions concerning the best planting distances, but generally the dwarf varieties which do not require staking are set out in rows 4ft. apart, with the plants approximately 2ft. 3in. apart in the rows, which gives approximately 5000 plants to the acre. For varieties which need to be staked the rows should be 3ft. apart, with the plants 12in. to 15in. apart in the rows, which would be approximately 12,000 plants to the acre.

No pruning is necessary for the dwarf varieties, but for those varieties trained to stakes the plants should be restricted to either one or two stems. This is accomplished by continually pinching out all lateral growth as soon as it appears.

During the growing season the soil should be kept thoroughly cultivated, but care should be taken to see that the roots of the plants are not injured. Deep cultivation is not recommended.

The tomato is not a deep-rooting plant, and the leaf surface is large in comparison with its root system. As evaporation from the leaves is considerable, it is necessary that the plants should receive frequent watering where the soil is inclined to dry out.

Disease Control

Tomatoes are subject to a full share of diseases and pests; therefore spraying should begin as soon as the plants have become properly established, and should be carried on at intervals of two to three weeks up to harvesting

(*Continued on page 384.*)

APIARY NOTES

Contributed by Officers of the Horticulture Division

Preparations for the Main Honey Flow

THE brood raised during October and November produces the bees which gather the main crop, and it is only a surplus of bees in the hives at the right time that can gather a surplus crop of honey. All colonies should be kept well supplied with food in the event of a change to unfavourable weather conditions. A check in brood-rearing any time from October onwards to the main honey flow is serious, and any colony which has failed to make good progress by this time, where there have been sufficient stores in the hive, requires special attention.

Most of the work in the apiary during the next few weeks will be to supply the hives with supers as the colonies grow in strength in preparation for the main honey flow, and to see that all queens have sufficient room in the brood nest to carry on egg-laying without interruption. Every year, even in well-cared-for apiaries, there are a number of medium strength colonies right at the start of the main honey flow, which usually begins some time in December in most localities throughout New Zealand, according to weather conditions.

Medium Strength Colonies

The condition of medium strength colonies at this time of the year may have been brought about by poor queens, or a combination of circumstances which prevented good or normal queens doing their best at a time when brood is most needed in the hives. This may happen when the colonies have been wintered in a damp, exposed position, in badly ventilated hives, or by a shortage of either honey or pollen. On the other hand, the brood chamber may be so clogged with pollen that the queens are restricted to a small space for egg-laying. Where the bee-keeper has provided proper and adequate accommodation for the queen and bees and there has been no food shortage, the poor condition and medium strength of any colony may be attributed to a poor or failing queen.

It is bad policy to lavish any further care on such colonies in trying to obtain a surplus crop of honey from them as separate producing units once the main honey flow has started, as it is then too late for the queens to make up the leeway and the colonies to raise sufficient brood to be of any practical use for that season.

Uniting the Colonies

All such colonies should be reduced by half. A good plan is to make up a number of nuclei from half of the medium strength hives by taking away the queen and one or two combs of brood with adhering bees. Place them about the apiary where they can be cared for and finally re-queened ready for next season's work.

The remaining portion of these hives, all combs, brood, and bees should then be united by the paper method to the balance of under-strength hives in the apiary. In this manner the united hives are brought up to full strength at the proper time of the season, and will each store a good surplus of honey. Economy in labour and materials is also effected.

Drones

While it is desirable and necessary to have drones flying in any apiary where queens are to be raised, the quality and number should be regulated by the bee-keeper. It is not possible for the average bee-keeper to control mating, but something can be done to improve the chances of the queens mating with good drones by eliminating all the drone comb possible in inferior colonies and decapitating with a sharp knife any drone cells started by them whenever opportunity occurs.

Although the bees secrete wax and build their combs, under normal conditions the bee-keeper in modern bee-keeping directs their activities by providing the hives with moveable frames fitted with securely wired or fastened foundations made of beeswax. This foundation bears the imprint of the base of the honey-comb used for the production of worker-bees, and discourages the production of drone-comb to a minimum. Full sheets of foundation should be used, and all old combs replaced with it. The best place in the hive to have foundation drawn or built out by the bees is in the first super above the brood-nest.

Pollen-clogged Combs

At this time of the year when combs are taken out of storage for use on the hives, a good number of pollen-clogged combs are found. If the combs are not very old and are brittle, scrape the pollen-filled cells down well into the pollen, taking care not to injure the base of the cells. Most of the pollen can then be shaken out, after which the combs may be placed one or two in the centre of each brood nest where the queen needs room for laying right at the height of the season. The bees will quickly clean out the balance of the pollen and build up the comb ready for use by the queen.

All very old, heavily-clogged combs should be boiled down at the first opportunity.

Swarming

Swarming is usually coincident with the beginning of the main honey flow, but the intensity of swarming fever varies with different strains of bees and seasonal conditions in different years.

While a colony of bees needs supplies of honey, pollen, and water, and is aided by the protection of good hives in developing its strength from the minimum population of the winter period to its maximum summer popu-

lation, another important item is that of room or space in the hive. In addition to room for brood, each colony needs room for its stores of pollen and honey, and also room for the young bees which are developed and continually hatching at this time of the year.

When a colony becomes overcrowded with young bees, preparations are made for swarming, and then only drastic measures will prevent the bees from carrying out their intention. To re-queen a hive at this stage does not help the bees to overcome the desire to swarm, and the new queen will leave the hive with the first swarm.

Preventive Measures

In addition to the supply of young queens early in the season, swarm control is largely a matter of comb and hive manipulation before the main honey flow, but when queen-cells have already been started and a hive increase is not desired, something must be done quickly to prevent the bees swarming.

A simple plan is to destroy all the queen-cells and divide the brood into two parts, leaving the queen and three or four combs of unsealed brood in the bottom box below the queen-excluder, together with frames of honey and pollen, filling the empty spaces with good worker-combs for the immediate use of the queen.

Place directly above the excluder any supers taken off the hive, and if none was present add one or two supers of empty combs, according to the strength of the colony. On the top of all place the remainder of the brood-nest (mostly capped brood), taking care not to raise pollen-combs above the excluder with this brood. If foundation is used place only one super at a time directly above the queen-excluder.

Examine the brood on top of the hive again after about six days, and destroy any queen-cells which may have been started.

The method of dividing the brood-nest as described and inserting the storage supers between the two portions is a modification of the Demaree system of swarm control, and should not be attempted until near the beginning of the main honey flow, when all danger of cold weather conditions has passed; otherwise there is danger of losing the brood placed on top of the hive by chilling.

Section Comb Honey

To produce good sections the hives must be crowded with young bees, and this condition tends to induce swarming. To get the bees in proper condition at the right time to raise sections, two hive bodies should be provided for the queen and brood, and young queens kept in all hives every year.

The producer of section comb honey, more than the producer of extracted honey, must consider the subject of ventilation, and should use only deep bottom boards raised from the level of the ground, with the entrance to hives wide open during the hottest period of the season. At other times, and when the bees are building up in strength, wooden blocks may be used to contract the entrance to the hives according to requirements.

While the bees are able to cluster without restriction on ordinary extracting frames fitted with foundation for the purpose of secreting wax, they must break up into small groups when comb-building in sections. Consequently, the work is much more difficult for them, and they will not readily work in the section supers.

A few drawn or partly-drawn sections saved from the previous season and placed in the section frames will help to draw the bees to the sections, or lifting two partly-filled combs of honey from below and placing them one each side of the section frames will have the same effect.

To induce the bees to build the comb right down to the bottom of the sections and not leave empty spaces below the comb, the foundation should be fastened so that parallel sides of the cells are horizontal instead of vertical, as they are in brood-frames.

The end of the sheet as it comes from the factory should be fastened to the top of the section and hung that way.

To keep the bees working in the sections while the main honey flow lasts and to prevent travel stains, it is advisable to remove the sections immediately the comb is fully capped by the bees, and replace with empty sections.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

COOL STORAGE NOTES—Continued from page 373.

The past season's crop of pears was comparatively light, but some delay was experienced in harvesting some of the fruit and getting it into cool storage in proper condition. A full crop of pears may be expected in the coming fruit season, and ample provision should be made for harvesting and marshalling the crop immediately into suitable cool chambers. These arrangements should be made beforehand so that there will be no delays in quickly reducing the temperature of the fruit after picking.

The shortage of cool storage space and the consequent delay in much of the fruit reaching cool storage has been responsible for some deterioration from over-maturity in many lines of fruit.

Unsuitable holding temperatures are a contributing factor in producing an advanced state of maturity in some varieties of apples. Sturmer apples grown in some districts have shown an aptitude to keep bitter if not reduced in temperature below 36deg. Granny Smith, Dougherty, Tasma, Delicious, and other varieties of apples which require the lower storage temperature of 32deg. to 33deg. should not be placed in cool storage chambers where temperatures are required to be maintained which are suitable for holding the Sturmer variety. This difficulty may largely be overcome by making arrangements for cool storing the fruit when the crop estimates are available.

Losses were experienced in fruit held in orchard storage. This method of storage is not recommended generally, but at present it is unavoidable because of insufficient cool storage accommodation.

After the fruit has been removed from cool storage chambers at the close of the fruit season the chambers should be thoroughly cleared of refuse and waste fruit, swept, and fumigated in readiness for the new season's fruit.

—A. POWELL, Cool Storage Officer, Wellington.

OUTDOOR TOMATO CULTURE — Continued from page 382.

period, using Bordeaux mixture at a strength of 3-4-50 for fungous diseases. When the first bunch of fruit is set, 1½lb. of lead arsenate powder should be added to each 100 gallons of the Bordeaux mixture for the control of caterpillars which are likely to attack the plants. In applying it special attention should be given to the base of the main stem, as it is most likely to be attacked by the small stem-boring caterpillars.—

—A. T. DOUGLAS, Orchard Instructor, Auckland.

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Preparation of Surplus Stock for Table Purposes

MOST poultry farmers will now have a fair idea of the number of young pullets and cockerels they will have from which to make selection for their own flocks. They will thus have some idea of the young stock available for disposal. Probably there will be a certain number of adult birds which are not producing as they should be, and the owner's position will be improved if these birds are culled.

It is unfortunate that the word "cull" is often misleading. To the poultry-keeper the term usually signifies a bird, young or adult, which will not pay if kept as an egg-producer. It may be, and very often is, quite healthy and in a good physical condition. To the consumer a cull is a poor, weak specimen of a bird with not much flesh on its bones—in fact, a bird which is really fit only to have its neck wrung. This fact will often adversely affect the sales of surplus stock, as they suffer from the stigma attached to the word "cull."

Special Feeding

However, the price received for the sale of surplus youngsters can often be improved, particularly when cockerels are sold for the table, by some additional care and attention to them for three or four weeks before their sale. This entails a system of special feeding to soften the flesh and add a certain amount of fat.

A point which should be stressed most strongly is that it will pay to fatten or prime only birds which are already in good physical condition; that is, birds which have a fair amount of flesh on their bones. That is one reason why growing cockerels should receive treatment and housing which is as good as that received by the growing pullet. Too often, one sees cockerels housed in cramped, badly-ventilated, and damp conditions while the pullet accommodation leaves little to be desired. It is small wonder that many poultry-keepers have difficulty in rearing good, sound cockerels from which to make their breeding selection when one considers the treatment they sometimes receive. In such cases the surplus cockerels are anything but well grown and well fleshed, and it is difficult to get them into a condition which will return a fair price.

Age to Sell

The best age at which to sell young stock for the table is between four and five months. This gives the farmer who wishes to plenty of time in which to get birds ready for the Christmas markets without making special hatches. For the first three months the management of future table birds is the same as that for future laying stock—sound, common-sense rearing and good feeding. At three months of age all stock which is not being kept or sold for laying purposes should be sorted out and housed by themselves in readiness for priming.

For anyone with ample range, one of the best systems to use at this stage is the night ark and free range. A night ark is simply a roosting shelter. The general size is about 6 ft. long by 3 ft. wide, and 4 ft. to 5 ft. high. There are various types, but they all have certain features in common. They are easily portable, and the floors are slatted or of wire-netting, and there is plenty of ventilation. Some have perpendicular sides and a span roof with a ridge ventilation, and others are of the apex pattern, in which the two long sides come straight up to the ridge from the ground. Such types will hold about thirty three- to four-months-old growers.

Simple Feeding

The feeding is plain and simple. A plain mash not too rich in protein once a day and a good feed of grain daily is about all that is required for birds on free range. If the run is limited, green feed will have to be provided. When the birds are about 3½ to 4 months old the most forward ones should be taken out for the finishing touches. These birds should be well grown, and when handled should give an impression of good weight for their size. Usually, this grading-out can be done once a week, but it depends finally on the demand for the finished product.

From this time onwards, exercise should be curtailed and the liberty of the birds restricted. Night arks may still be used for housing, but additional shade will be beneficial. A frame supported on four posts and roughly thatched with brushwood or straw will answer the purpose.

At this point some people—the English commercial fatteners, for instance—make a complete and drastic change in the feeding. The birds are starved for 24 hours, but have water and plenty of flint or gravel grit. The first meal after this fasting period is a wet mash composed of, say, equal parts of pollard, barley-meal, and maize-meal, and 5 per cent. of skim-milk powder. This mash is mixed with water until it is the consistency of thick gruel and can be poured from a bucket or dipper. This meal will not be a large one, because it often follows a period of many weeks of dry mash feeding or is much wetter than anything the birds have been accustomed to.

Small Helpings

For the next meal a greater quantity may be put in the troughs in front of the birds, and once it is seen they are taking to it readily every effort should be made to encourage them to eat as much of the fattening mash as possible at each meal time. Some people prefer to feed the birds at this

stage with three meals a day. This is not necessary, as my experience has shown that excellent results can be obtained with two meals a day, although the birds must be fully satisfied after each meal. The best way of ensuring this is to give just enough to last the birds for five minutes, that is, fill the troughs a quarter to one-half full. As soon as this food is eaten, put in more. With these repeated small helpings the birds eat ravenously until they are satisfied, and almost always eat more than if a surplus of food had been placed in front of them at the beginning.

The best times for feeding are as near to 12-hour intervals as the general routine work of the farm will allow. Most birds will stand this intensive feeding for at least one week, and in many cases two weeks is needed to obtain the best results. Except in hot weather, no water should be given, the birds obtaining their moisture requirements from the slop feed. This again helps to make them eat more than normally.

Other Mixtures

So far, only one mixture has been mentioned, but there are others which give good results. Perhaps the best is composed of 20 parts oat pollard (Sussex ground oats), 1 part skim-milk powder, and enough water to mix, usually about 10 to 12 parts. Oat pollard should not be confused with oatmeal. The former is the whole oat ground to a fine meal, including the husk. Generally, only the plump, hard, thin-skinned varieties of oats make good oat pollard. Satisfactory results can be obtained by replacing some of the oat pollard with fine maize-meal or barley-meal.

All food should be mixed for several hours before use. This allows the mixture to become thoroughly smooth, with all lumps broken down. A 40-gallon wooden barrel sawn in half makes two excellent mixing tubs for this work. After feeding, all food not eaten should be collected from the troughs and used up at the next meal time. It is only by observation and experience that one can tell when birds reach their prime. At this stage their appetites begin to fail, and selection should then be made of the best birds for disposal.

Cramming Not Advisable

Cramming is often advised for getting a good finish on table birds. Generally, this advice comes from people with little practical knowledge or experience. Cramming only pays when the services of an expert crammer are available. Anyone can learn to use a cramming machine, but skill is required in knowing when a bird is ready for cramming and how much cramming is necessary. If the period of cramming is too short it is wasted, and if it is carried on too long the bird will lose condition rapidly. The crammed chicken is a luxury article, and should command a commensurate price. Otherwise, it definitely does not pay to cram, and attention should be concentrated on obtaining the best possible results by trough feeding.

It is not necessary to have expensive accommodation for priming. Wooden coops along the lines of broody coops and holding four to six birds are satisfactory, and they may be placed in any sheltered spot. Excellent troughs may be made by two lengths of 3 in. x 1 in. timber fastened together in V form, with the ends blocked. These troughs can be rested on wooden brackets or hung on cords at a convenient height for the birds in the coops.

Effect of Starvation

When birds are being sold by dead weight always starve them before killing, otherwise there is a grave danger of the food in the intestines causing the flesh of the carcass around the vent to turn green. Not only is this very unsightly, but it will also adversely affect the price received. During this period of starvation, which is usually 12 to 24 hours, drinking water should be given.

The birds should be killed by dislocation of the neck. This allows the blood to drain from the body, which preserves a good flesh colour. Plucking is carried out in the usual method. Tying down or dressing should be done in a manner most acceptable to the customer.

Ensure that your Fowls are Profitable . . .

by Reading

"UTILITY POULTRY KEEPING"

Bulletin No. 66 **PRICE 1/-**

This practical booklet, which is published by the Department of Agriculture, is the recognised standard work on poultry-keeping under New Zealand conditions.

Send cash with order to . . .

THE PUBLISHER,
DEPARTMENT OF AGRICULTURE
Private Bag, Wellington.

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Farm School and Tour of Northland

By J. M. BARR, Hon. Secretary, Kaukapakapa Y.F.C.

A PARTY of Young Farmers from various districts in lower North Auckland took part recently in a Farm School at Whangarei and a tour of some of the districts further north.

After assembling at Whangarei and a leisurely stroll around the town the party was officially welcomed to the district by Mr. James, President of the A. and P. Society, and Mr. Rushbrook, Chairman of the Whangarei Y.F.C. Mr. E. B. Glanville, Instructor in Agriculture for the district, then exhibited a number of "sound" films.

The A. and P. Society's Centennial Exhibition was being held at the time, and complimentary tickets were kindly provided by the society. The successful co-operation of town and country demonstrated there, and the quite noticeable keenness about the town generally, were evidence of the faith held in the future of the north.

One well-filled day was spent attending various lectures and demonstrations. Mr. T. H. Hankin, Government Veterinarian carried out a post mortem of a cow, giving informative explanations of the functions of the various organs, etc. Later in the day he followed this up with a lecture on the latest methods of treating common ailments in dairy stock. Mr. M. J. Scott, Supervisor of the Pig Industry, gave a lantern lecture on "The Management of Pigs," and Mr. H. Woodyear Smith spoke on "Australian Agriculture," using films taken by himself on a recent tour.

First Stage of Trip

The main feature of the week was the tour north from Whangarei, and in clear, bracing weather the party set out on the first stage of the trip. With Opononi, on the Hokianga Harbour, as our destination we were able to reach Kerikeri, Bay of Islands, for lunch. Both Mr. E. B. Glanville and Mr. Woodyear Smith accompanied the party, and between them saw that no point of interest was missed. The bus was stopped at many places on the route, when farms of special interest were pointed out, various soil-types described, and many other features of the countryside noted and explained.

Members of the touring party watching a veterinary demonstration at Whangarei.

At Kerikeri the party met members of the local Young Farmers' Club, and with them were shown over the citrus curing shed. Mr. P. Everett, Orchard Instructor for the district, described the various processes and discussed citrus culture in general. After lunch visits were made to an orange orchard and also to some groves of tung oil trees.

Proceeding via Waimate North, the many historic homes and buildings hereabouts provided further variety of interest, while the barren ironstone plains made great contrast with the productive volcanic soil of the Kerikeri citrus area. Passing through Kaikohe and on through Native development lands, Opononi was reached at dusk, with still time to be impressed with the natural beauty of the surroundings. A late night followed, for the visitors had arranged a debate, the subject being "That it is undesirable for Young Farmers to Marry in Wartime." After some very entertaining speeches the debate resulted in a draw.

Kauri Forest

On the second day's journey several stops were made in the Waipoua Kauri Forest, members being impressed by the size of some of the trees and by the extent and apparent healthiness of the forest. The Dargaville Experimental Farm was reached about noon, lunch being provided there by the Dargaville Y.F.C. Mr. E. H. Arnold.

the local Instructor in Agriculture, afterwards conducted the party over the farm. After a trip to the recently-developed consolidated sand country on the coastal side of Dargaville, land which has shown great results in production, the party proceeded on the final stage of the journey back to Whangarei.

The Whangarei Y.F.C. had arranged its annual dance to coincide with our visit, and we were its guests for the evening. A very rousing welcome was accorded us and with good music and the very friendly spirit prevailing the evening proved most successful and enjoyable.

Next morning we assembled at the wool stall at the show, where Mr. Harrison described and dealt with the skirting and handling of a small wool clip. Mr. P. S. Syme, Department of Agriculture, followed with a lecture on "Manurial Problems," and, giving due consideration to wartime shortages, provided sound advice on topdressing programmes for the immediate future. A lantern lecture by Mr. W. Alexander on "Fat Lamb Production" added further variety to the lecture programme, and gave rise to useful discussion.

Cement Works Visited

A visit to the cement works at Portland was made during the afternoon. Mr. Leese, the chief chemist, carefully explained each process to the party, and answered many questions about practical concrete work on the farm. The last lecture of the tour was given by Mr. Durney, of the Herd Improvement Association, who spoke on "The Advantages of Herd-testing," and with very striking production graphs showed how essential this knowledge is if continued progress in the diarying industry is to be expected.

Next day, after a final visit to the exhibition, the members dispersed to their homes, and this concluded a memorable visit to the Northland. It had proved a very successful tour, and to this end the carefully-planned variety of the programme and good organisation in carrying it out were essential factors. For the knowledge and enjoyment provided, and the friendships made, our thanks are due to many people; to the lecturers for carefully-prepared addresses; to the Whangarei Y.F.C.; to people at Whangarei and on the route for their interest and hospitality; to the popular bus-driver; and finally to Mr. Glanville, who was responsible for the carrying out of the programme and whose company throughout assured the happy spirit which characterised the whole trip.

Eastern Southland Debating Contest

YOUNG Farmers from three districts in Eastern Southland recently took part in a debate. Four teams participated in two separate contests, the subject being "That the Truth is not Always Advisable." The debate was on a different basis from usual, the teams being aware of the subject, but not knowing which side they would take until a few minutes before the start. The result was practically an impromptu effort, and in view of the conditions very excellent performances were made. The Otama B team was given the award for the evening, which entitles it to contest the provincial final with the Western Southland winner. All arrangements for the contest were carried out by Mr. W. Faithful, the District Y.F.C. Secretary.

The Chairman, Mr. S. D. Blomfield, said that because of petrol restrictions it had been necessary to alter the system of conducting the debates. Formerly, elimination contests had been held, but the committee had found it advisable to centralise the contests. The team scoring the highest aggregate of points for the evening would be adjudged the winner for the Eastern Southland area, and if possible would meet the winning Western Southland team in the final for the province. He extended a welcome to Mr. E. A. Cameron, of Wendonside, Provincial President of the Farmers' Union.

In the first debate the affirmative was taken by Maitland and the negative by Otama B. Varied arguments were heard from both sides, and one or two excellent speeches were given, particularly that of the leader of the Otama team.

The teams were:—

Otama B: E. MacKay (leader), P. MacKay, and M. White.

Maitland: A. McKenzie (leader), R. White, and A. Weir.

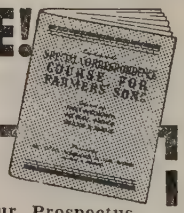
LEARN FARM MANAGEMENT & FARM BOOK-KEEPING

SUCCESSFUL FARMERS don't rush to Accountants and Lawyers with every accounting and legal problem that arises. They know that the men who can conduct the affairs of THEIR farms with the utmost speed and efficiency, and at the lowest cost, are THEMSELVES.

SUCCESSFUL FARMERS therefore understand the principles of farm accounting, book-keeping, finance, management, taxation, and legal rights. THAT is one of the reasons for their success.

You, too, can quickly acquire a full knowledge of practical farm accountancy farm business management, legal rights and taxation, which will make you independent of professional advice regarding the scores of small matters which constantly arise, and which will enable you to manage your farm at less cost and to show a greater profit.

FREE!



Do not delay. Send this Coupon for full information and a complete brochure of the Farm Accounting Association's Accountancy Course. No obligation.

THE FARM ACCOUNTING ASSOCIATION OF N.Z. (INC.), P.O. Box 693, Dunedin.
Please send me a Free copy of your Prospectus.
NAME .....
ADDRESS .....
..... J.A. 240

In the second debate Balfour took the affirmative and Otama A the negative. Both sides produced some sound views and there was very little to choose between them.

The teams were:—

Otama A: E. Cameron (leader), R. Williams, and A. Dillon.

Balfour: L. Mulqueen (leader), A. P. Mulqueen, and D. Lamb.

The results were announced by the judge, Mr. E. C. Smith, of Gore, as follows:—

Otama B, 1; Otama A, 2; Maitland, 3; Balfour, 4.

In giving his decision, Mr. Smith said that there had been very little between the teams, except that Otama B had a good lead in marks. Taken as a whole, the affirmative speakers had the better side from the point of view of expediency, but the negative side had a sounder argument from a moral aspect. In his opinion the sounder argument had been put up by the affirmative. There appeared to be a good deal of confusion in the minds of the speakers as to the exact meaning of the subject, but this could be understood in view of the fact that no preparation had been possible. Taken generally, the deportment of the speakers had been excellent, and evidently they had had some experience in public speaking, showing no signs of nervousness. In fact, the delivery and deportment had been very good indeed. There was little to criticise in the way of pronunciation and grammar, and despite one or two slips the general standard had been good.

At the conclusion of the debate Mr. Blomfield extended congratuations to the Otama B team on its performance, and thanked Mr. Smith for carrying out the duties of judge.

Final of Wanganui Y.F.C. District Debating Competition for 1940

By A. R. DINGWALL, District Secretary, Wanganui.

THE final contest of the Wanganui Y.F.C. District Debating Competition for 1940 was held in Scotts Hall, Hunterville, when representative teams from the Mangaweka Club (winners of the Northern Zone) and the Marton Club (winners of the Southern Zone) debated the question, "Does Agriculture offer as good an opportunity to Young Men as does Other Employment?" The Mangaweka Club was represented by R. Weston (leader), A. T. Green and C. Dickson, and the Marton team by A. B. Marshall, W. Grey and F. Smith. Mr. C. B. Anderson, Chairman of the Wanganui District Y.F.C. Committee, presided, and Mr. R. M. S. Jones, Hunterville, was the adjudicator.

After a very keenly contested debate the Mangaweka team, supporting the contention that agriculture does offer as good an opportunity to young men as other employment, was successful in gaining the judge's award and the District Championship, but only by a narrow margin of points. The Mangaweka Club, which is the most recently-formed club in the Wanganui area, thus has the honour of winning in the first year of its competition the Debating Cup donated by Mr. H. Kimpton, Marton.

Hall and supper araringements for the final contest were carried out by the Hunterville Club.

In previous rounds of the debating competition the Wanganui District area was divided into two zones, a Northern and a Southern, in order to facilitate contact and overcome any transport difficulties during the earlier stages of the contest. The Northern Zone contestants comprised teams from the Waimarino, Taihape and Mangaweka Clubs.

In the first round in this zone Mangaweka succeeded with a win over the Waimarino team when taking the affirmative of that contentious subject, "That Girls should be admitted to the Y.F. Clubs." The Mangaweka Club reached the final of the district contest by a default win over the Taihape team, winners of the 1939-40 competition. It was most unfortunate that the Taihape Club found it necessary to withdraw from the competition, as a team from this club can usually give a good account of itself in debate.

In the Southern Zone the Marton team defeated Hunterville in the first round and Bulls (winners of the Bulls-Westmere first round contest) in the second round.

It is pleasing to note the interest and enthusiasm in debating which have arisen throughout the clubs during the present year, and more especially where members of clubs which had not previously taken part in inter-club debates were concerned.

All clubs are to be congratulated on the support which they gave to this year's competitions.

Taumarunui Debate

By L. E. McKINNON, Hon. Secretary, Taumarunui Y.F.C.

MEMBERS of the Taumarunui Young Farmers' Club were recently the guests of the Taumarunui Anglican Young People's Club, when a debate was held between teams representing the two clubs.

The teams were: Mr. Wheatcroft, Miss P. Robertson, and Mr. Fittall (Anglican Young People's Club), and L. McKinnon, G. Kinnall, and A. Harvey (Y.F.C.).

The subject was: "That it is in the best interests that we have licensing in the King Country." The Young Farmers' Club team took the affirmative, and after an interesting contest emerged victorious by 154 points to 142. Mr. Clift acted as judge.

Putaruru Y.F.C. Hay Stack Building Competition

By C. S. DALGLIESH, District Secretary, Rotorua.

THREE years ago a hay stack building competition was initiated by the Putaruru Young Farmers' Club, and the Putaruru A. and P. Association kindly donated a silver cup for competition among the club members.

As the conserving of hay is a very important factor in the success of farming, and the consistent loss of good stock food through wastage of hay due to insufficient care in stack building and protection from weather is altogether too prominent throughout many districts in the Dominion, it was considered that the competitors should have for their main aim the careful attention to stack building, protection from weather, and the erection of a sound fence as a safeguard from stock. The quality of the material—the better pasture grasses as against the inferior pasture grasses—was not to be taken into consideration when judging, the object being to conserve safely the material harvested, be it good or second-class pasture hay.

The rules set up as a standard for judging were as follows:—

Site, 10; building, 55; protection from weather, 15; fencing and general care, 20; total, 100.

In the 1937-38 season A. McGowan was the winner of the competition, R. Baldwin being the successful competitor for 1938-39.

Results for 1939-40 season are as follows:—

	Site.	Building.	Protection.	Fencing etc.	Tl.
1st—S. Penwarden	5	55	15	20	95
2nd—A. Ruthe ..	10	45	10	15	80
3rd—R. Baldwin .	10	40	10	15	75

Mr. E. W. R. Leslie, "Wiltsdown," judged the competition in the 1937-38 season, Mr. A. T. Morriss, "Overdale," officiating for the past two years.

At the recent meeting of the club Mr. Morriss gave a short address to members on the building and care of hay stacks. Mr. Morriss favoured the round stack as being the most economical and easiest to handle.

Arrangements are in train for holding a field day at an early date. The proposal is to have a veterinary lecture and a post-mortem on a diseased animal, together with a practical demonstration of team work and care of the horse.

During the present period, when every effort is being made to increase production, the value of such competitions and field days cannot be overestimated, and it is hoped that during the coming season a competition in ensilage-making will take place.

Dipton Club's Annual Concert and Dance

By G. V. HELM, Hon. Secretary, Difton Y.F.C.

THERE was a large attendance at a highly successful Young Farmers' concert and dance held recently in the Dipton Hall. Mr. D. Milligan was the organiser, Mr. F. McRae, the chairman, and Miss Wood, the pianist.

The programme, which consisted of a good variety of the latest music and popular song hits well spaced with monologues and burlesque sketches, etc., was as follows:—

Opening numbers by Young Farmers' choir, singing three songs, New Zealand National Anthem, "Pardon Song," and "Keep on Smiling"; newspaper sketch, G. Leith and G. Helm; "Roll Out the Barrel" ("Beer Barrel Polka") by the choir, the barrel being duly rolled; violin duet, the Misses Nickelson; quartette ("When My Dream Boat Comes Home"), C. Gray, M. English, B. King, and D. Milligan; item by the Y.F.C. Swing Band; two numbers by the choir, "The Umbrella Man" and "The Man With the Mandolin," I. Craig playing mandolin accompaniment; sketch entitled "Nagging," played by J. Palmer, I. Craig, B. Wilson, and C. Gray; violin duet, the Misses Nickelson; duet, "Misty Islands" and "The Lights of London," by G. Leith and B. Mitchell; comedy monologue, "On Behalf of the Working Man," by R. Milligan; humorous drill squad, B. Wilson, G. Helm, I. Ballantine, and M. Wilson; band item, burlesque sketch, "Kiss Me Good-night, Sergeant-Major," W. King, J. Palmer, G. Helm, and C. Gray, with choir. The final item, "Wish Me Luck," was sung by the choir, after which various officials were thanked and the pianist, Miss Wood, received a small present.

After the National Anthem supper was served by the Women's Division of the Farmers' Union. The evening concluded with an enjoyable dance.

Fairlie Club's Activities

By W. B. McCONNELL, Hon. Secretary, Fairlie Y.F.C.

THE Fairlie Y.F.C. is experiencing the most successful year in its history in spite of the trying times. The meetings generally have been well attended, and 12 new members have been enrolled. The activities of the club have taken the form of debates within the club and with outside organisations, visiting stud sheep farms and lime works, lectures by club members and outside persons, as well as the producing of the new films under the auspices of the International Harvester Co. During the season the club held a very successful dance.

Full support is also being given to patriotic purposes in the district, and at present the support for the South Canterbury Queen Carnival is under consideration. The club is fortunate in having a wealth of very interested members as well as a highly efficient advisory president in Mr. W. Scott. The success of the Y.F.C. movement under the present conditions augurs well for the future.

The club's officials are as follows:—Chairman, P. F. Carter; secretary, W. B. McConnell; treasurer, R. McBean; advisory president, Mr. W. Scott.

Looking to the Future

By N. LAMONT, District Y.F.C. Secretary, Masterton.

AT no time more than the present has it been so necessary for Young Farmers' Clubs to encourage the enrolment of young members leaving school. There are many who question the wisdom of raising the retiring age to 30, and, while this step appeared to be justified at the time by the desire of the "aged 25 group" to retain their connection with the clubs, it may have serious repercussions if active steps are not taken to encourage younger members to join up as soon as they leave school—if not sooner.

Senior club members must recognise their responsibility to their clubs and be prepared to look ahead beyond the time when they have retired from active participation in club affairs. In many cases this is not being done, and consequently the average age of members is steadily rising.

It is, therefore, most commendable on the part of the Carterton Club officers to go out of their way, as they are doing, to assist the local high school with lectures and demonstrations for the agricultural classes. Not only are they performing a useful service, but they are also establishing an invaluable contact with boys, who will, as a result, be much more likely to join up with an organisation already familiar to them.

Future Y.F.C. members — Class from the local High School taking notes during a lecture on agriculture.

[N. Lamont, photo.

Among the Clubs: Reports on Activities

Western Southland.

Dipton.—Donation of £5 to Red Cross Fund. Talk by C. Johnson, a club member, on "Canterbury Agricultural College Sheep Farmers' Short Course."

Lochiel.—General. Mr. Colin Lindsay spoke on "Raising of Fat Lambs."

Wyndham.—General business. The speaker for the evening was Mr. S. R. Whyte, Hon. Sec. Otago-Southland Y.F.C. Council, his subject being "Activities of Different Young Farmers' Clubs."

Eastern Southland.

Balfour.—Report on the debating competition held in Gore. Proposed club library discussed. Talks were given by club members as follows: "Management of Breeding Ewes," "Trees," and "Activities in Wool Stores During the Busy Season."

Crookston.—General business. Mr. S. H. Saxby, Department of Agriculture, gave a lantern lecture on "The Identification of Grasses." This talk was followed by a competition of naming some 22 varieties of grasses displayed by the speaker. Supper was served by the local branch of the W.D.F.U. At a previous meeting two teams were chosen to represent the club at the Gore debating contest: A team, E. Cameron, R. Williams, and A. Dillon; B team, S. Mackay, L. Mackay, and W. White. A talk entitled "Farming in U.S.A." was given by Mr. A. Mackay.

South Otago.

Clinton.—Centennial tree planting discussed. Mr. O. J. Howells, solicitor, Gore, addressed the meeting on "Laws Relating to Farming in New Zealand."

Lawrence.—Mr. Ireton, traffic inspector, gave a talk on "Rules of the Road and Causes of Road Accidents."

Stirling.—General business. Mr. Stewart addressed the meeting on "How to Increase Production."

Warepa.—General business. Talks were given by club members as follows:—"Blood Circulation" (W. F. Ashman) and "Fractures" (R. Whittaker.

Central Otago.

Roxburgh.—General. Members were guests of Hacremai Club at a social evening.

Upper Clutha.—Mr. H. R. Denize, Department of Agriculture, and Mr. N. McDonald, spoke on "Pig Husbandry."

Dunedin.

West Taieri.—Arranged for inter-club debate with South Taieri Club. Short speeches were given by club members and an impromptu debate was also held.

North Otago.

Enfield.—Correspondence read relative to shearing class at Roxburgh. Suggestions were made as to how the club could be improved. At a previous meeting Mr. J. D. McLeod gave a short address on "The War Effort and the Primary Producer."

Hampden.—A lecture and film display was given by Mr. H. R. Denize, Department of Agriculture, and Mr. N. McDonald, Supervisor of the Otago and Southland Pig Council. The speakers dealt mainly with "Animal Husbandry" and "The Pig Council's Work Generally."

Papakaio.—General. Mr. T. A. Sellwood, Department of Agriculture, showed some interesting films dealing with "Increased Production."

Tokarahi.—General business. Films on "How To Increase Production" were shown by Mr. T. A. Sellwood.

South Canterbury.

Milford.—General business. Discussions on various agricultural topics.

Pleasant Point.—Club's debating team congratulated on its winning the South Canterbury Debating Contest. The team comprised A. D. Talbot, O. R. Chapman, and F. R. Clarke. Mr. C. Preen showed an interesting film on "A Tour Through Europe and America on the Eve of the Present War."

Waihaorunga.—The sum of £5 to be donated to the local Patriotic Fund. Mr. A. Grant, Department of Agriculture, spoke on "Lucerne."

Mid-Canterbury.

Hinds.—Dog trials to be held. A motion of sympathy passed with the relatives of the

late Mr. Stewart Wells. Mr. G. K. McPherson, Department of Agriculture, gave an address on "Pastures."

Methven.—Proposed stock judging competition was discussed. Professor McMeeken, Lincoln College, gave an instructive talk (illustrated with films) on "Farming in Other Lands." He dealt in particular with Denmark, Sweden, and Argentine.

Christchurch.

Darfield.—Annual ball arrangements completed. Debate to be held with Sheffield Farmers' Union. Annual debate with Darfield Farmers' Union. The subject was: "That It is Essential to the Future Welfare of New Zealand that Secondary Industries be Further Expanded." The Y.F.C., which took the negative, was represented by J. D. Green, B. E. Jarman, R. H. Bedford, and J. W. Stewart, and this team was placed first by 306 points to 297. The Farmers' Union side consisted of G. C. Warren, J. Syme, J. Cullen, and H. J. Buttle. Mr. F. A. Bull acted as adjudicator.

Ellesmere.—Field day to be held; £1 1s donated to local A. and P. Association. Christmas parcels to be sent to members serving overseas. Short impromptu speeches were given by some 30 members. The talks covered a wide range of agricultural subjects, and proved most interesting.

Springston.—General. Some of the International Harvester Company's films were shown to the meeting.

Teddington.—General business. An officer of the Defence Department discussed the forming of the Ellesmere Mounted Rifle Squadron for the defence of Banks Peninsula.

North Canterbury.

Amuri.—General. Address by Mr. D. Sherritt on "Law As It Concerns the Farmer."

Cheviot.—A lantern lecture on "Lime" was given by Mr. A. S. Nash, Department of Agriculture. The speaker also told the meeting some facts regarding "Linen Flax."

Nelson.

Dovedale.—General business. Mr. D. Merry, Department of Agriculture, gave a lantern lecture on "Plant Diseases."

Moutere.—An invitation to attend the local branch of the W.D.F.U.'s birthday party was accepted. A valuable address on "Calf Rearing" was given by Mr. R. W. Skinner, Department of Agriculture.

Murchison.—General. Mr. A. D. Mercer, Department of Agriculture, gave a lecture on "The Advantages of Purchasing Fertilisers."

Wairarapa.

Alfredton.—Debate to be held with Masterton Club. Members decided to take part in fleece competition. Arrangements for club dance. The speaker for the evening was Mr. O. Walton, his subjects being "Farm Accountancy" and "The Preparation of Income Tax Returns."

Carterton.—Appointment of stewards for judging competitions to be held at Carterton Show. An inter-club debate with Greytown Club, the subject being: "That Supplying a Cheese Factory is a Better Proposition than Supplying a Butter Factory." The teams were:—Carterton: B. Brassell, A. Fisher, and M. Knutson. Greytown: R. Knowles, V. Gates, and M. McKenzie. The Carterton side gained the decision.

Greytown.—General. Mr. S. Freeman, Dominion Organising Secretary, spoke on "The Y.F.C. Movement and Its Part in the War Effort." This address was followed by a sound film display.

Martinborough.—General. Lectures were given by Messrs. Scott and Coisky on "Fat Lamb Breeding" and "Distribution of Meat in Britain" respectively.

Horowhenua.

Levin.—Decided to give £1 1s to the local W.D.F.U. Fighter Plane Fund. A talk entitled "The Establishment and Treatment of Lucerne" was given by Mr. G. S. Robinson, Department of Agriculture.

Tokomaru.—Arrangements for club dance. New member elected. Mr. G. S. Robinson, Department of Agriculture, spoke on "Lucerne."

Manawatu.

Apiti.—Annual dance arrangements finalised. Donated £5 to Fighter Plane Fund. Mr. R. P. Gilder, Department of Agriculture, addressed the meeting on "Topics of Veterinary Interest."

Colyton.—General. Mr. E. O. C. Hyde spoke on "Seed Testing."

Feilding.—Club debate to be held. Two new members enrolled. Presentation of cups to two club members who were successful in the recent Wellington Council Stock Judging Competitions. Two talks were given by club members—"Seeds" (A. C. Buist) and "Y.F.C. South Island Tours" (C. Lobb).

Halcombe.—Shearing competition discussed. Arrangements for dance. An interesting lantern lecture on "Animal Diseases" was given by Mr. J. Hill-Motion.

Rangiotu.—General. Donation of £2 2s to the London Distress Appeal.

Rongotea.—Field day to be held. Chairman and secretary elected to represent the club on the Patriotic Committee. A talk was given by Mr. J. Hill-Motion on "Sterility and Abortion in Dairy Cattle."

Waituna.—Club shearing competition and dance to be held. Mr. L. W. Gorman, Plant Research Station, Palmerston North, gave an interesting and instructive lecture on "Grassland Farming and Pasture Work."

Whakaronga.—Arrangements for club dance. Christmas cakes to be sent to members on active service. A talk entitled "The Growing and Feeding of Sugar Beet" was given by Mr. H. de O. Chamberlain.

Wanganui.

Waimarino.—General business. An interesting lecture on "The Mortgage Readjustment Commission" was given by Mr. Ashmore.

South Taranaki.

Alton.—Dance to be held. A lecture was given by Mr. F. L. Knowles on "The History and Value of Herd Recording."

Central Taranaki.

Cardiff.—General. All members present were required to give a short talk on "Shelter on the Farm."

Pukengahu.—Dance to be held in aid of patriotic funds. Three new members enrolled.

Tarata-Pukeho.—Proceeds of card parties donated to Patriotic Fund. Mr. W. V. McIntyre gave an address on "Common Diseases in Sheep."

North Taranaki.

Hillsborough-Tarurutangi.—Club obtained supplies of petrol for members attending meetings, and a sub-committee was appointed to arrange distribution to car owners. Messrs. N. Sampson (chairman), A. Kain (advisory president), and R. C. Sampson (advisory member) addressed members on "The Advantages Received in Attending Y.F.C. Functions." At a previous meeting Mr. L. Knowles, of the New Zealand Dairy Board, gave an interesting address on "Mineral Requirements of Dairy Stock."

Karawaka.—Debate held with senior pupils of the Lepperton School, the subject being: "That for Winter Feeding Hay and Ensilage is Superior to Hay and Roots." A club radio talk to be prepared. Mr. J. M. Hopkins, Department of Agriculture, spoke on "Winter Feeding of Livestock."

Okau-Tongaporutu.—Donation of £1 1s made to Taranaki Fighter Plane Fund. Mr. Hastings gave a lecture on "Pig Marketing Association Activities."

Southern Hawke's Bay.

Ballance.—General. A question night was held.

Woodville.—Funds to be raised for Fighter Plane Fund. The sum of £1 donated to Patriotic Fund. Centennial tree planting finalised. A talk entitled "Seasonal Troubles in Dairy Stock" was given by Mr. M. D. Murray.

Central Hawke's Bay.

Waipukurau.—General discussion on club affairs. Mr. J. W. Palmer, Department of Agriculture, gave a lecture on "The Y.F.C. Movement's Part in the War Effort."

Northern Hawke's Bay.

Putorino.—Mr. R. P. Hill, Department of Agriculture, addressed the meeting on the subjects "Pasture Management" and "The Value of Sugar Beet for Pig Feeding." At previously unreported meetings talks were given as follows:—"Seasonal Diseases in Stock" (Mr. Laing), "Cultivation and Value of Lucerne" (Mr. Bousted), "Ailments of Dairy Cows" (Mr. F. Hudson), and "Cobalt Deficiency" (Mr. F. Hudson).

Poverty Bay.

Matawai.—Impromptu speeches. Mr. E. M. Bates, Department of Agriculture, discussed "The Method of Preparing and Presenting a Speech."

Western Bay of Plenty.

Kati Kati.—Field day to be held.

Paengaroa.—Annual dance arrangements finalised. Mr. Speed, of the International Harvester Co., demonstrated the setting of a mower. Short talks were given by the following members: G. Spencer, G. MacFarlane, W. Marshall, J. Hope, T. Oakley, L. Ashe, and T. Wilson.

Pukehina.—General. Mr. Whitham addressed the meeting on "Herd Improvement."

Tauranga.—General discussion on club affairs.

Te Puke.—New member enrolled. Speeches were delivered by the following:—"Maize Growing" (T. Tanner), "Whey as a Pig Food" (D. McNaughton), "Inventions" (R. McNaughton), "Rearing Chickens" (S. Winter), "Structure of a Cow's Udder" (B. Caldwell), "Introduction of Fertiliser Into Te Puke District" (D. Verco), "A Water System at the Waiari River" (D. Caldwell), "Introducing Constitution Into Our Dairy Herds" (R. Currin), "Nongataha State Hatchery" (J. Nichol), and "Control of Abortion in Dairy Cows" (P. Nichol). P. Nichol won the prize for the best speaker, and S. Winter gained the prize for the most improved speaker. Field day held on Mr. K. A. Bennett's farm, where the party inspected the stock and obtained useful information from Mr. Bennett relative to their breeding.

Waikato.

Hauraki.—One new member elected. Mr. C. Walker, Department of Agriculture, showed a number of agricultural films, including "Seed Dispersal," "Our Daily Bread," "Clover," and "The Salt of the Earth."

Kakepuku.—Field day held on Mr. A. E. Ray's property. Mr. H. J. Webber, of the N.Z.C.D.C. Pig Farm, Te Awamutu, demonstrated on types for breeding sows, fat pigs, etc., in breeds of Tamworth, Devon, Berkshire, Large White.

Tauhei.—Club dance arranged. General business.

Tahuna.—An effort to be made by all members to collect waste metal as a war effort. Mock Court to be held to raise funds for the London Distress Appeal.

Te Awamutu.—General. Social evening held. Field day took place in Te Awamutu, the industries visited being butter and dried milk factories, "Courier" printing office, and the local telephone exchange.

Auckland.

Franklin.—General business. A lecture was given by Mr. W. D. Corby on "Herd Improvement." At a previous meeting a talk entitled "Rural Roading Problems" was given by Messrs. Bettany (engineer of Franklin County Council) and Peterson (council member for Drury Riding).

Kaukapakapa.—General. Talks by club members: "Common Diseases of Sheep" (N. A. Barr), "Report on Field Day at Mr. M. Glavish's Property" (H. Adams).

Whangarei.

Matarau.—General. Lantern lecture by Mr. E. B. Glanville on "The Reclaiming and Grassing of Tidal Flats."

Maungatapere.—Mr. Pearson spoke on "Pig Husbandry and Housing."

Dargaville.

Tangiteroria.—Sum of £2 donated to Fighter Plane Fund. Decided to hold dances for patriotic purposes. Impromptu debate held.

Health Notes for the Farm

Contributed by the Department of Health

Protection of Children and the Public From Infectious Diseases

ALTHOUGH the object of this article is to draw attention in the interest of public health to the regulations governing the exclusion from school of children suffering from any infectious disease, or who have been exposed to such infection, some general reference might well be made to this group of diseases.

All infectious diseases have much in common. Infection is transmitted from person to person by minute living particles or germs, the germs of individual diseases having distinctive characters. When germs are conveyed from individual to individual, such as by kissing or by the coughing of mucus from an infected throat into the face of someone nearby, "direct infection" is said to occur.

"Indirect infection" is said to occur when the disease germs are conveyed from one person to another through the medium of some object, as, for instance, when a lead pencil sucked by a child whose throat contains diphtheria germs is passed on and resucked by another child, who subsequently develops the disease.

The period between the time of entrance of the germ into the system and the onset of the first symptom is known as "incubation period," during which certain changes occur within the body. This is followed by "invasion" of the disease, shown by the characteristic symptoms of illness. After this, if recovery takes place, there is usually immunity from any further illness due to the same type of infection.

Immunity is brought about because a defensive mechanism set up by the blood cells of the patient results in the formation of what are known as "anti-bodies" or "anti-toxins," which neutralise the toxins or poisons manufactured by the germs of disease, and may destroy the germs themselves. A diphtheria patient who is treated with "anti-toxin" is given a dose of ready-made anti-bodies with the aim of immediately neutralising the rapid and often deadly action of diphtheria germs. The condition produced is described as "passive immunity."

When we vaccinate people as a preventive measure we inoculate them with minute doses of the toxins or poisons manufactured by the specific germs of the disease against which we wish to protect them; we thus deliberately produce within the blood cells of the vaccinated person a reaction resulting in the production of anti-bodies. Disease germs subsequently entering find the territory hostile, and they are unable to develop. This is known as "active immunity."

Preventive treatment for dipththeria which has in recent years been widely carried out in various parts of New Zaland has for its object the creation of a large group of children with active immunity to diphtheria, so that epidemic spread of the disease is rendered impossible.

The isolation of a person suffering from an infectious disease is among the important measures we rely on for the prevention of the spread of the disease once it has appeared. With this aim in view the following regulations relating to patients and contacts have been designed.

REGULATIONS

For the exclusion from School of Children suffering from any Infectious Disease, or who have been exposed to Infection from any Infectious Disease.

Disease.	Period of Exclusion from School of Children Suffering from Infection Disease (Patients).	Period of Exclusion from School of Children Exposed to Infection (Contacts).
ENTERIC FEVER (Typhoid Fever, Paratyphoid Fever)	For at least six weeks from the date of onset of the disease and until a certificate is furnished by the medical attendant that the period of isolation prescribed by regulation has been completed.	Not to be excluded unless the Medical Officer of Health directs.

Disease.	Period of Exclusion from School of Children Suffering from Infection Disease (Patients).	Period of Exclusion from School of Children Exposed to Infection (Contacts).
DIPHTHERIA	For at least three weeks from the date of onset of the disease and until a certificate is furnished by the medical attendant that the period of isolation prescribed by regulation has been completed.	(1) If patient treated at home, until disinfection of house has been carried out. (2) If patient removed to hospital, until seven days after disinfection of house subsequent to removal. (3) In either case, until a certificate of clearance has been received from an Inspector.
SCARLET FEVER (Scarlatina)	For at least four weeks from the date of onset of the disease and until a certificate is furnished by the medical attendant that the period of isolation prescribed by regulation has been completed.	
CEREBRO-SPINAL FEVER (Cerebro-spinal Meningitis)	For at least four weeks from the date of onset of the disease and until a certificate is furnished by the medical attendant that the period of isolation prescribed by regulation has been completed.	(1) If patient treated at home, until disinfection of house has been carried out. (2) If patient removed to hospital, until ten days after disinfection of house subsequent to removal. (3) In either case, until a certificate of clearance has been received from an Inspector.
POLYOMYELITIS (Acute Poliomyelitis, Infantile Paralysis)	For at least six weeks from the date of onset of the disease.	(1) If patient treated at home, until disinfection of house has been carried out. (2) If patient removed to hospital, until fourteen days after disinfection of house subsequent to removal. (3) In either case, until a certificate of clearance has been received from an Inspector.
ENCEPHALITIS LETHARGICA	For at least six weeks from the date of onset of the disease.	
CONSUMPTION (Phthisis, Pulmonary Tuberculosis)	To be excluded only if disease is accompanied by coughing or spitting, or if tubercle bacilli be found in sputum, faucial, or nasal discharges.	Not to be excluded.
SMALLPOX (Variola, including Varioloid, Alastrim)	Until every scab has fallen off and all skin lesions have healed.	(1) If patient treated at home, until disinfection of house has been carried out. (2) If patient removed to hospital, until eighteen days after disinfection of house subsequent to removal. (3) In either case, until a certificate of clearance has been received from an Inspector.
MEASLES (Morbilli)	For at least two weeks from the date of the appearance of the rash and until convalescence is satisfactorily established.	(1) If the child has had the disease, not to be excluded except in so far as is provided hereunder in paragraph 3. (2) If the child has not had the disease, until sixteen days from the occurrence of last case. (3) If the disease is not epidemic when the first cases occur in a school, all children from the infected home to be excluded from school until sixteen days from occurrence of last case.
GERMAN MEASLES (Rubella)	For at least two weeks from the date of the appearance of the rash and until convalescence is satisfactorily established.	Not to be excluded unless the Medical Officer of Health or the School Medical Officer directs.

Disease.	Period of Exclusion from School of Children Suffering from Infection Disease (Patients).	Period of Exclusion from School of Children Exposed to Infection (Contacts).
WHOOPING-COUGH	Until the characteristic spasmodic cough and the whooping have ceased for at least two weeks; or, in cases of persistent whooping, for not less than six weeks from the commencement of the spasmodic cough.	(1) If the child has had the disease, not to be excluded except in so far as is provided hereunder in paragraph 3. (2) If the child has not had the disease, until twenty-one days from occurrence of last case. (3) If the disease is not epidemic when the first cases occur in a school, all children from the infected home to be excluded from school until twenty-one days from occurrence of last case.
INFLUENZA (Mild)	Until the temperature has been normal for at least four days and catarrhal symptoms have disappeared.	(1) If patient treated at home, until period of isolation of patient has expired. (2) If patient removed to hospital, until four days from date of removal.
Fulminant, Pneumonic and Septicaemic Influenza	Until a certificate is furnished by the medical attendant that the patient has recovered and the period of isolation prescribed by regulation has been completed.	
MUMPS (Epidemic Parotitis)	For at least two weeks from the commencement, provided that one clear week has elapsed since the complete subsidence of the swelling.	Not to be excluded unless the Medical Officer of Health or the School Medical Officer directs.
CHICKEN-POX (Varicella)	For at least two weeks and until every scab is off scalp and body.	
RINGWORM, TRACHOMA, SCABIES (Itch), IMPETIGO CONTAGIOSA	Until a certificate is furnished by a medical practitioner that child is cured. Wherever certificates are not readily procurable teachers to use their discretion.	Not to be excluded unless the Medical Officer of Health or the School Medical Officer directs.
PEDICULOSIS (Lice)	Until a certificate is furnished by a medical practitioner that child is cured. Wherever certificates are not readily procurable teachers to use their discretion.	Not to be excluded unless the Medical Officer of Health or the School Medical Officer directs.

Under special circumstances these periods may be extended by a Medical Officer of Health, or by a School Medical Officer after consultation with a Medical Officer of Health.

General.

The head teacher will be notified by the Inspector of any infected house from which school-children whose names are on the roll must not be allowed to attend.

Teachers should avoid sending messages by any school-children to houses of absentees, lest they should thereby become exposed to infection.

Section 58 of the Education Act, 1914, inter alia, makes it lawful for the teacher of any school to forbid the attendance of any child who may be likely to communicate any contagious (infectious) disease.

If the Medical Officer of Health, or the School Medical Officer, or any medical attendant should certify in any special case that the periods of exclusion given above should be extended, teachers are to observe such instructions.

In those cases where a medical certificate is required before the child resumes school attendance and any difficulty is experienced in obtaining such certificate, the matter should be referred to the Medical Officer of Health. Any certificate issued by the latter may be accepted in lieu of a certificate from the medical attendant.

Children must not be allowed to return to or attend school while wearing infected clothing, or clothing which has been exposed to infection. Section 86 of the Health Act, 1920, states, inter alia, that every person is liable to a fine not exceeding £10 who knowingly exposes any things (clothing, school requisites, etc.) which have been exposed to infection from any infectious disease, unless they have first been effectively disinfected or proper precautions have been taken against spreading the infection.

Information as to disinfection appeared in the previous article of this series or can be obtained on application to the local Inspector of Health, or to the Medical Officer of Health.

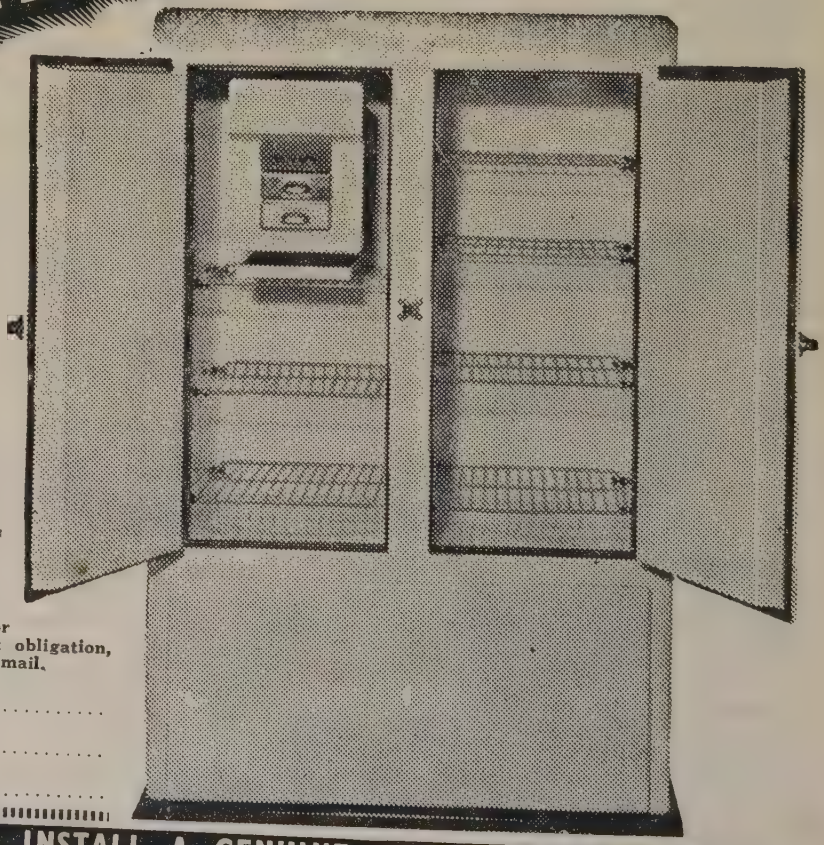
WHEN THEY COME IN HOT AND TIRED...

serve them something really

COLD!

Frigidaire brings you the city convenience of iced drinks, ice cream, and the freshness of food kept crisp and cold on Summer's hottest day. No bacteria can live in Frigidaire cooled milk, butter, vegetables, meat and other perishables. And you SAVE when you buy Frigidaire. You save by eliminating all food spoilage. You save endless trampings to outside pantries or dairies . . . . and your husband saves trouble and money by reducing the number of kills.

this FRIGIDAIRE *is built specially for farmers!*



This FRIGIDAIRE Refrigerator is built by General Motors specially for farmers. It has a meat rail and will hold a whole sheep if necessary! A genuine Frigidaire is today's soundest investment for the farm home. Send the coupon below for full particulars.

FRIGIDAIRE

Frigidaire is distributed by:
Frigidaire New Zealand (Division of General Motors New Zealand Limited, Petone).

FREE

FRIGIDAIRE NEW ZEALAND
PETONE.
Dear Sirs.

I am interested in your Frigidaire which is specially built for the farmer. Will you please send me, without obligation, full details and illustrated literature by return mail.

NAME .....

ADDRESS .....

.....

BE MODERN • BE THRIFTY • INSTALL A GENUINE FRIGIDAIRE THIS YEAR!

The Farm Home and Kitchen

Contributed by the Association for Country Education

How To Prepare Poultry For the Market or Table

DURING the summer there are few meals more delicious than cold poultry and salad, and for the Christmas dinner, with many families, roast turkey or some other roast bird is a tradition which is always kept up. There is consequently a demand in home and market for good table birds, extending from before Christmas right through the holidays. The woman on the land is the best able to benefit by this demand, for, if she cares to take up the matter, she can make quite a good thing out of marketing table birds alive or dressed.

Selection of Birds

Except when killing off old hens for culling purposes and selling them as "boilers," only fowls in first-class condition should be killed for the table.

Several methods can be used by producer and consumer alike to determine the age and sex. Apart from the difference in size, the young bird is less muscular than the mature bird, and the flesh on the breast and thighs feels softer to the touch, and there is also less fat on the abdomen.

The rear end of the breast bone of a young bird is flexible and soft, while after one year old it hardens and lacks flexibility. The length and sharpness of the spurs on cockerels and roosters also indicate their age.

Ducks and geese can be selected for age by pressing the windpipe between finger and thumb. In young birds the windpipe is pliable, in old birds it is rigid.

The age of turkeys is judged in the same way as for fowls.

The fleshing or condition of the bird has much to do with its tenderness. A well-fleshed bird has a full, round breast, light-coloured skin, and ridges of fat along the feather tracts. It is not always possible to avoid pin feathers in young birds, but older birds should be chosen that are in a full-feathered condition, as there will be no pin feathers to make plucking difficult and to spoil the appearance.

Very fat hens are not of the best quality because of the strong fat flavour and the loss in weight of melted fat.

Other signs of a good bird are: The head should be alert with a beady, bright eye; the body well feathered, with lustrous plumage, and a well-rounded breast; the legs well rounded and smooth.

Birds may be fattened off by being confined in crates and fed four times a day with all they can eat in 15 to 20 minutes of the following mash:—Four parts crushed oats to six parts crushed maize, mixed to a mash with sour or fresh skimmed milk.

Killing and Dressing

The bird should have water but no mash for six to eight hours, and no whole grain for 12 to 14 hours, before killing. Either break the neck or chop off the head and hang the bird head down so that all blood will drain out of the body.

Scald the fowl in water at approximately 170deg. Fahrenheit. If no thermometer is available this temperature may be obtained by mixing **one cup of cold water to every quart of boiling water.** Dip the bird completely three to five times, and allow two to four seconds of immersion each time. Test by pulling out a few feathers to see if the skin has been softened. A young bird may be needed to be immersed only twice, an older bird the full five times. Over-scalding discolours and breaks the skin and spoils the appearance.

Hang the fowl by the feet and rub the feathers off with a downward pressure of the hands.

To Kill Ducks and Geese.—Open the veins at the side of the neck. Before scalding, sprinkle a little powdered resin through the feathers. Scald as described above, and rub off the feathers. After the feathers have been removed, wring out some cloths in scalding water and wrap these around the body, and leave to steam for several minutes. The down will then rub off with a blunt knife. Always wash the bird well after plucking, using soda in the water if necessary to cut the grease.

Drawing Poultry

Split the skin down the back of the neck lengthwise. Loosen the neck and cut it off as near the body as possible. Remove the windpipe, crop, and gullet. Next, cut right round the vent and slit the abdomen up towards one side of the breast bone. Reach in for the gizzard, and pull out the intestines and other organs. Sever the heart, liver, and gizzard, and save them. With the first finger loosen and remove the lungs from the ribs in the back of the carcass, and also the reproductive organs. Cut out the oil sac at the base of the tail. Wash the inside with cold water. Drain well and rub inside with salt. Split and skin the gizzard and carefully remove the gall bladder from the liver. Wash and drain the giblets.

Method of Trussing

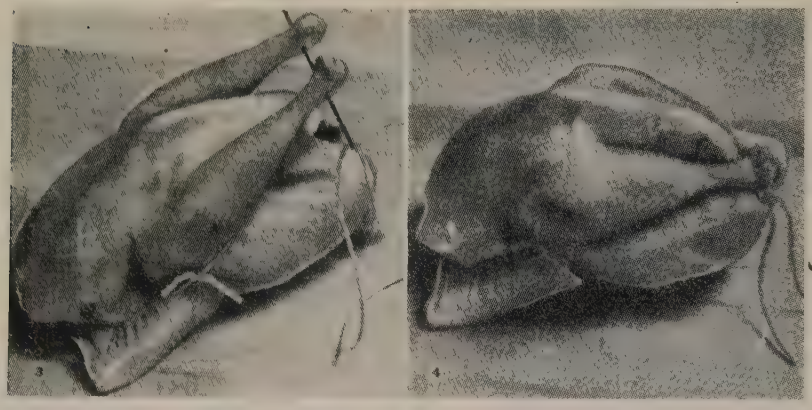
The method of trussing given on page 398 has been taken from the "Farmer's Wife Magazine," and seems to be an improvement on those formerly used, as, even if dressed birds are bought trussed at the market, the purchaser can open them for stuffing by simply untying a cord.

Roasting Poultry

Stuff the fowl and truss it. Put a mixture of lard and dripping in the roasting pan, and heat it in an oven at 400 to 425 degrees F. (hot). Meanwhile, lightly rub seasoned flour into the

(1) Insert needle through breast at base of thighs. Draw cord through and bring string across the back by

(2) pulling cord through openings formed by folding wings onto the back. (See also Fig. 5). The needle does not go through the flesh here. Tie cord at one side, making body of bird compact.



(3) If the bird is used at home, put in part of dressing through vent opening. Then insert needle between two bones at each drumstick joint, and bring cord around the tail.

(4) Tie (with a bow-knot) so legs fit closely at each side of breast bone and are secure to the tail. This closes the vent opening.

(5) The neck opening offers a place to insert part or all of stuffing, which should be filled in to make breast and neck well rounded.

(6) Fold neck skin under wing tips and string to keep in stuffing and make a neat appearance. Remove cords before sending to the table for carving.

skin of the bird and lay over it strips of bacon, or cover the breast with a thick layer of fat. Put the bird into the fat when it is hot, and cook for 10 minutes at 425 degrees. Then reduce the temperature to 300 to 325 degrees (a very moderation oven). Cover the bird with a double sheet of greaseproof paper, or put on the lid of the double roaster. Continue to cook until the bird is done—about 1½ hours for a young bird weighing 5 lb. (dressed but not drawn). Baste at intervals if necessary.

For small turkeys (8 to 10 lb.), allow 20 to 25 minutes per lb.

For medium turkeys (10 to 16 lb.), allow 18 to 20 minutes per lb.

For large turkeys (18 to 25 lb), allow 15 to 18 minutes per lb.

(Roast turkey uncovered. Lay on its side, and turn regularly so that alternate sides are uppermost. Baste as necessary.)

The test for "done-ness" is a loose leg joint when the drumstick is twisted.

(Every care must be taken not to allow oven temperature to rise enough to overcook and dry out the flesh.)

Steaming Vegetables

M.S.A. (DUNEDIN)—

I was interested to read of the different methods of preparing cabbage and wondered whether any of the readers have tried steaming their vegetables, including cabbage. Personally, I think there is nothing to equal it if vegetables must be cooked. Another advantage, too, is that different vegetables can be done at the same time, although when steaming beetroot and onions with other vegetables I roll each in greaseproof paper. Beets done this way can be used as a "hot" veg. and any left over sliced and sprinkled with lemon juice (not vinegar) make a delicious salad. Steamed cauliflower (whole) is totally different from the ordinary way of cooking.

ASSOCIATION'S REPLY—

Steaming is a satisfactory and economical way of cooking most vegetables, but **greens**, including cabbage, are better cooked in boiling water, as this heats them through more quickly and so arrests enzyme action, which destroys Vitamin C.

The recipe for Harvard Beet is as follows:—

2lb beets, ½ cup vinegar, ½ beet water, sugar, third cup, cornflour, 2¼ oz.

Method.—Boil beets until tender (2½ to 3½ hours). Plunge into cold water and remove skins. Cut into dice. Make sauce. Heat all liquids together, add cornflour mixed to smooth paste with cold water. Boil five minutes. Pour over beets and reheat.

Recipes for Christmas

Fruit Cakes

GINGER BEER FRUIT CAKE

Butter, 1½ lb.; sugar, 1 lb.; flour, 1½ lb.; eggs, 12 or 9; currants, 1 lb.; sultanas, 1 lb.; raisins, 1 lb.; peel, ½ lb.; cherries, ¼ lb.; ground almonds, ¼ lb.; glycerine, 2 tablespoonfuls; brandy, 2 tablespoonfuls; nutmeg (grated), 1; cinnamon, 1 teaspoonful; salt, ½ teaspoon; ginger ale, 1 bottle (6d.).

Method—Cut up fruit very finely and soak all night in ginger ale. Cream the butter and sugar, add eggs well beaten little by little not to have the mixture curdle. Beat well. Then add flour and spices, fruit, and lastly glycerine and brandy. **Almond Icing:** ½lb. almond meal, ½ teaspoon essence, ½ lb. icing sugar, 2 egg yolks.

PINEAPPLE FRUIT CAKE

Butter, 1 lb.; sugar (light brown), 1 lb.; eggs, 12; flour, 1½ lb.; cinnamon, 2 teaspoonfuls; nutmeg, ½ teaspoonful; mixed spice, 2 teaspoonfuls; vanilla, rose, almond, lemon, 1 teaspoonful of each; raisins, 1½ lb.; sultanas 1½ lb.; currants, 1 lb.; cherries, 1 lb.; lemon peel, ¾ lb.; dates, 1 lb.; ginger, 1 lb.; almonds, 1 lb.; pineapple, 2 large tins (juice strained off); brandy, ½ cup.

Method—Follow the general method for making a fruit cake. Place in the middle of the oven. Start at 325°F. then reduce to 250°F. after 1 hour. Bake 5 hours. (For pineapple, cut in large pieces, approximately 8-12 to slice).

ECONOMICAL FRUIT CAKE

Flour, 1 lb.; butter, ½ lb.; brown sugar, ½ lb.; fruit, 1½ lb.; milk, ¾ cup; eggs, 3; syrup, 1 tablespoonful; soda, 1 teaspoon; peel, ¼ lb.; almonds, ¼ lb.

Method—Add soda and syrup to milk and heat gently till dissolved. Rub butter into sifted flour, add sugar and fruit. Pour in milk, soda and syrup, and beaten eggs. Bake 2½-3 hours.

Plum Puddings

CARROT PLUM PUDDING (A)

Raw grated carrot, 1 cup; raw grated potato, 1 cup; melted dripping, ½ cup; sugar, 1 cup; flour, 1 cup; fruit mixed, 1½ cups; soda, 1 teaspoon; salt, 1 teaspoon; nutmeg, ¼ teaspoon; cinnamon, ½ teaspoon.

Method—Prepare and grate vegetables. Measure and mix all dry ingredients and add fruit and vegetables and lastly melted fat. Steam four hours and serve with lemon sauce.

CARROT PLUM PUDDING (B)

Breadcrumbs, 8 oz.; flour, 4 oz.; finely chopped suet, 4 oz.; raisins (stoned and halved), 4 oz.; light brown sugar, 4 oz.; currants (washed and dried), 4 oz.; shredded candied peel, 2 oz.; raw grated carrot, 2 oz.; finely grated lemon rind, 1 teaspoon; grated nutmeg, ½ teaspoon; baking powder, 1 teaspoon; milk, ¼ pint; eggs, 2.

Method—Mix all dry ingredients except the baking powder together, add the beaten eggs and sufficient milk thoroughly to moisten the whole, then cover and let the mixture stand for about an hour. When ready, stir in the baking powder, turn into a greased mould or basin, and boil for about six hours, or steam for about seven hours. Sufficient for nine. Serve with a suitable sauce.

MINCE MEAT

1 lb. finely chopped suet; 1 lb. currants, washed and picked; 1 lb. raisins, stoned and quartered; 1 lb. chopped apples; ½ saltspoon each nutmeg, mace; 1 lb. castor sugar; ½ lb. sultanas; ¼ lb. shredded mixed peel; 2 lemons (rind and juice); ½ gill brandy.

Method—Pare the lemons thinly, simmer the rinds in a little water till perfectly tender, then pound them, or rub them through a fine sieve. Mix all the ingredients well together, press into a jar, cover closely, and keep in a cool dry place for a month before using.

TRIFLE

Sponge cake, 1; raspberry jam, 6 tablespoons; fruit, 10 slices pineapple; fruit juice, ¾ cup; almonds, 1 oz.; cream, 1 cup; sherry (if desired), ¼ cup to each cup of fruit juice; milk, 1 cup; egg, 1; sugar, 1 tablespoon; vanilla, ½ teaspoon; made into a soft custard.

Method—Split sponge and spread with raspberry jam. Pour over it the fruit juice. Spread pineapple (cut in pieces) over the sponge and pour over it the cold custard. Sprinkle with chopped almonds and decorate with whipped cream. **Note:** Apricots or other such fruit may be substituted for the pineapple if desired. Serves ten.

Crumb Crust Pies

CRUMB PIE SHELL (Suitable for Parties).

3 tablespoons melted butter; 1 cup fnely ground plain biscuits (malt, ginger, etc.).

Method — Mix together thoroughly until blended, line tin moulding well. Leave for some time in a cool place. Fill with the filling.

FRUIT PIE

Gelatin, 1½ tablespoons; cold water, ¼ cup; sugar, ½ cup; hot water, ½ cup; orange juice, ½ cup; lemon juice, 2 tablespoons; salt ¼ teaspoon; crushed pineapple, ½ cup; sliced bananas, 1; egg white, 1; cream, ½ cup.

Method—Mix gelatin with cold water. Dissolve with sugar in hot water. Add fruit juices and stir. Cool, and when beginning to set, beat. Fold in pineapple, banana, whipped cream, and egg white, stiffly beaten. Pour into biscuit crumb shell and chill. Sufficient for 9in. pie plate.

LEMON CHIFFON PIE

Gelatin, 1 tablespoon; cold water, ¼ cup; eggs, 4; sugar, 1 cup; lemon juice, ½ cup; salt, 1 teaspoon; lemon rind, 1 teaspoon.

Method—Soak gelatin in cold water five minutes. Separate egg whites and egg yolks. Add ½ cup sugar, lemon juice and salt to beaten egg yolks. Cook in double boiler till thick. Add softened gelatin to softened egg custard and stir till dissolved. Add rind. Cool, and when beginning to thicken add ½ sugar to beaten whites and fold in the setting custard. Pile into piecrust.

Sweets For Christmas

MARSHMALLOWS

Sugar, 2 cups; gelatin, 2 tablespoons; vanilla, 1 teaspoon; water, 1¼ cups; salt, pinch.

Method—Soak gelatin in half the water. Put remainder with the sugar in a saucepan and boil to the soft ball stage (238°F.). Add the gelatin and let stand till partially cool. Add vanilla and salt. Beat till white and thick and pour into a dish that has been dusted with powdered sugar. When set, cut in pieces and roll in icing sugar. Chopped raisins may be stirred in before it is beaten or the cubes may be rolled in cocoanut browned in the oven.

DIVINITY FUDGE

Granulated sugar, 3½ cups; egg whites, 2; water, 2/3rd cup; vanilla; syrup, ½ cup; salt, ½ teaspoonful; walnuts (sliced), 1½ cups.

Method—Cook syrup, sugar, water and salt to soft ball test (238°F.). Reserve ½ cup syrup, cook the remainder to hard ball test (248°F.). On to the beaten whites pour very gradually the first ½ cup syrup beating constantly, then add the remainder of syrup. Add nuts and vanilla and keep beating until the mass thickens and becomes heavy. Pack in buttered tins and cut before it is cold. Use a platter and wire spoon when beating.

VASSAR FUDGE

Brown sugar, 2 cups; butter, 2 tablespoons; vanilla, ½ teaspoonful; milk, ¾ cup; chocolate, 2 oz.

Method—Melt the chocolate (over hot water), add sugar and milk and bring to the boil. Then add the butter, stir until ingredients are blended but after boiling point is reached do not stir. Heat slowly until soft ball stage (238°F.). Pour into bowl and leave to cool to 110°F. Add flavouring essences and beat until creamy and beginning to thicken. Pour into greased tin and mark when cold.

Table of Contents — November, 1940

"Let 1940-41 Be a Seed Production Year"—*R. B. Tennent* 321
Feeding Dairy Cows for Milk Production—*N. Lamont* 323
Ensilage Is a Savings Bank for Fodder—*J. E. Bell* 329
Tuberculosis in Pigs—*D. Marshall* 337
Slaughterings of Stock—*Livestock Division* 338
Growing Swede Crops for Winter Feed—*C. S. Dalgliesh* 339
Swedes in the Southern King Country—*W. T. Brown* 341
Beware of Kikuyu Grass—*P. S. Syme* .. 343
Kikuyu Grass on Sand Dunes—*J. E. Bell* .. 347
Certification of Perennial Ryegrass Seed—*J. H. Claridge* 349
Copra as a Pig Feed—*M. J. Scott* 351
Controlling Club-root of Swedes and Turnips—*J. W. Woodcock* 353
Butter and Cheese Grading—*Dairy Division* 355
Director-General's Page 356
Veterinary Notes—*Livestock Division* .. 358
Farm Practice and Management—*Fields Division* 365
The Orchard and Vineyard — *Horticulture Division* 370
Citrus Canker Regulations, 1940 — *A. E. Morrison* 374
Recognition and Control of Citrus Diseases in New Zealand—*A. M. W. Greig* 375
The Home Garden—*Horticulture Division* .. 381
Apiary Notes—*Horticulture Division* .. 383
Poultry-keeping Section—*Livestock Division* 385
Young Farmers' Clubs—*S. Freeman, Editor* 387
Health Notes—*Department of Health* .. 393
The Farm Home and Kitchen—*Association for Country Education* 397

And Miscellaneous Matter.

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand, which is payable in advance and includes postage, is 2s. 6d. a year. The overseas subscription is 5s. Subscriptions should be forwarded or paid direct to any office of the Department of Agriculture in the Dominion. Single copies, price 6d., are available from the Department of Agriculture, Private Bag, Wellington.

COPYRIGHT PROVISIONS

The articles in the "Journal" of the Department of Agriculture of New Zealand are copyright. Proprietors of newspapers and periodicals wishing to republish any matter are at liberty to do so, *provided both the "Journal" and author are acknowledged.*

The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

Printed by Blundell Bros., Limited (The Evening Post), Wellington.—801

NEW ZEALAND DEPARTMENT OF AGRICULTURE

Publications Available for General Distribution

FREE BULLETINS.

51. Testing Milk and Cream for Content of Fat.
69. The Onion and its Related Species.
77. The Home Orchard.
81. Budding of Fruit Trees.
84. Orchard Establishment and the Formation of Young Fruit Trees.
96. Lemon Culture.
98 Grafting of Fruit Trees.
101. Brown Rot of Stone Fruits.
102. Vine Culture under Glass.
104. Silver-leaf in Orchards.
105. Manures and Manuring for Garden Crops.
118. The Cleaning of Milking Machines.
119. American Foul-brood and its Treatment.
137. Tobacco Culture for Small Growers.
139. The Production and Grading of Cream.
140. Caseous Lymphadenitis in Sheep.
145. Contagious Abortion in Dairy Cattle.
148. Hogget Mortality and its Prevention.
149. Moulds in Unsalted Butter.
150. Castration of Pigs and Calves.
152. Parturition of Bovines.
154. The Milking Shed.
155. Lucerne on the Farm.
157. The Rabbit Pest and its Control.
158. Precautions Necessary in Handling Sodium Chlorate.
164. Vines for the Home Garden.
166. Johne's Disease.
*168. Influence of Salt on the Flavour of Butter.
169. Packing Apples and Pears in Standard Cases.
170. Mole Drainage in the Manawatu.
*171. Internal Parasites of Sheep and Calves.
*172. Foot Rot in Sheep.
*173. "Sleepy Sickness" and Bearing Trouble in Ewes.
*179. Hydroponics—Growing Plants Without Soil.
*180. Cobalt Deficiency in Sheep and Cattle.
181. Sheep Dipping and Sheep Dipping Baths.

Unnumbered Bulletins.
Apiaries Act and its Amendments.
*Facial Eczema in Sheep and Cattle.
*Milk Fever and Grass Staggers in Dairy Cows.

Bulletins marked thus * are reprints from the "Journal of Agriculture" since January, 1938.

CHARGEABLE BULLETINS.

(Cash with Order)

(If remittance includes stamps, do not include denominations greater than 2d.).

		s.	d.
66.	Utility Poultry Keeping	1	0
74.	Tomato Culture	0	6
103.	A Standard Wool Shed for New Zealand Conditions	0	6
120.	Irrigation	1	0
124.	Handling the Wool Clip for Sale	0	6
128.	Beekeeping	1	0
167.	Modern Methods of Pig Production	0	6
177.	Layout and Construction of Modern Piggeries	1	0
	New Zealand Seeds for Pasture and Lawns	0	6
	Unnumbered Bulletins.		
	Annual list of Creameries, Factories, Private Dairies and Packing Houses, 1940	2	0

BOUND HALF-YEARLY VOLUMES of *N.Z. Journal of Agriculture* (with Index); Volumes 4-13; 15; 17-19; 27; 36-40; 43; 45-47; 55; well bound in green cloth and lettered. Price per volume 4s. 6d., or 5s. postage paid (remittance with orders).

Volumes 56, 57, 58 and 59 (new size), 6s. 3d., or 7s. 6d. per volume, posted.

INDEXES to *N.Z. Journal of Agriculture* for Half-yearly Bound Volumes 1; 5; 7-20; 24-40; 42; 47; 53-56 Free on application.

CONSOLIDATED GENERAL INDEX of *N.Z. Journal of Agriculture*, Volumes I. to XX. (1910 to 1920). Price 2s. (remittance with order).

Spring backed covers for *Journal*. Green cloth boards with name on back. Hold six or more monthly numbers prior to January, 1938. (Not suitable for issues after December, 1937). Price 2s. 6d. each. New ones (plain back) for enlarged *Journal* since January, 1938. Price 3/-. each.

Address applications for any of the above to the Publisher, Department of Agriculture, Wellington N.Z.

"CATERPILLAR"

REGISTERED TRADE MARK

TRACTORS BLAZE the TRAIL

for GREATER PRODUCTION

Illustration shows "Caterpillar" cleared land being broken in with "Caterpillar" powered 5-ton Roman Disc Plough preparatory to final cultivation.

FREE — WRITE or CALL FOR ILLUSTRATED LITERATURE.

NEW Zealand's effort to meet the imperative National need of increased primary production is being assisted by "CATERPILLAR" Land Clearing Machinery. Gough, Gough & Hamer, by their West Coast Land Clearing Demonstration last year, proved the sound successfulness of the "CATERPILLAR" way of clearing bush, grubbing stumps, draining swamps and preparing the soil for sowing. New acres are now being opened and brought into production throughout New Zealand by the "CATERPILLAR" way, and the good work is being carried on by "CATERPILLAR" Tractors and Land Clearing Machinery. The big job of breaking in virgin bush and the regular cultivation of the land are both advantageously performed by "CATERPILLAR" . . . learn how "CATERPILLAR" Tractors can assist you . . . Gough, Gough & Hamer Ltd. welcome all enquiries and gladly supply full particulars.

GOUGH, GOUGH & HAMER, LTD

HEAD OFFICE—CHRISTCHURCH.

Branches at: Auckland, Wellington, Dunedin, Palmerston North, Rotorua, Masterton, Stratford, Hastings, Ashburton, Oamaru and Invercargill